JULY 30, 2003

TEST REPORT #203183, REV.1.1

QMSS/QFSS CONNECTOR TESTING

PART NUMBER

QMSS-104-11-L-D-A
QFSS-104-01-L-D-A

SAMTEC, INC.

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

1478 - 01
ACCREDITED
1478 - 02

Contech Research

REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
7/30/2003	1.0	Initial Issue	TP
9/19/03	1.1	Editorial changes made at the request of Samtec.	TP

CERTIFICATION

This is to certify that the QTS-RA/QSS-RA 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 and ANSI/NCSL Z540-1, 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:js

SCOPE

To perform qualification testing on the QMSS/QFSS 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: TC0313-0166

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)	QMSS Connectors	QMSS-104-11-L-D-A
b)	QFSS Connectors	QFSS-104-01-L-D-A

2. A “stabilizing medium” was assembled between the test samples.

3. Test samples were supplied assembled and terminated to test boards by the test sponsor.

4. Figure #1 illustrates the test board layout used for mounting test samples.

5. The test samples were tested in their ‘as received’ condition.

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

TEST SELECTION

1. See Test Plan Flow Diagram, Figure #2, for test sequences used.

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:

Sequence A : Group A - A-A-1,A-A-2,A-A-3
Group B1 - A-B1-1,A-B1-2,A-B1-3
: Group B2 - A-B2-1,A-B2-2,A-B2-3
: Group B3 - A-B3-1,A-B3-2,A-B3-3

Sequence 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

Sequence C : Group A - C-A-9,C-A-10,C-A-11,C-A-12,
C-A-13,C-A-14,C-A-15,C-A-16

Sequence D : Group A - D-A-1,D-A-2,D-A-3,D-A-4

Sequence E : Group A - E-A-17,E-A-18,E-A-19,E-A-20,
- E-A-21,E-A-22,E-A-23,E-A-24

Sample ID Key

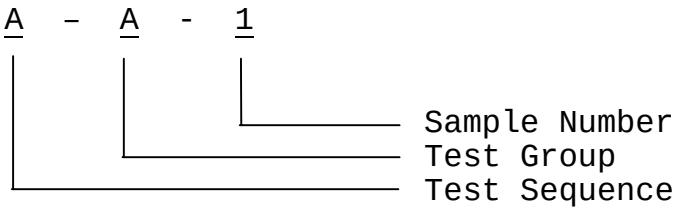


FIGURE #1

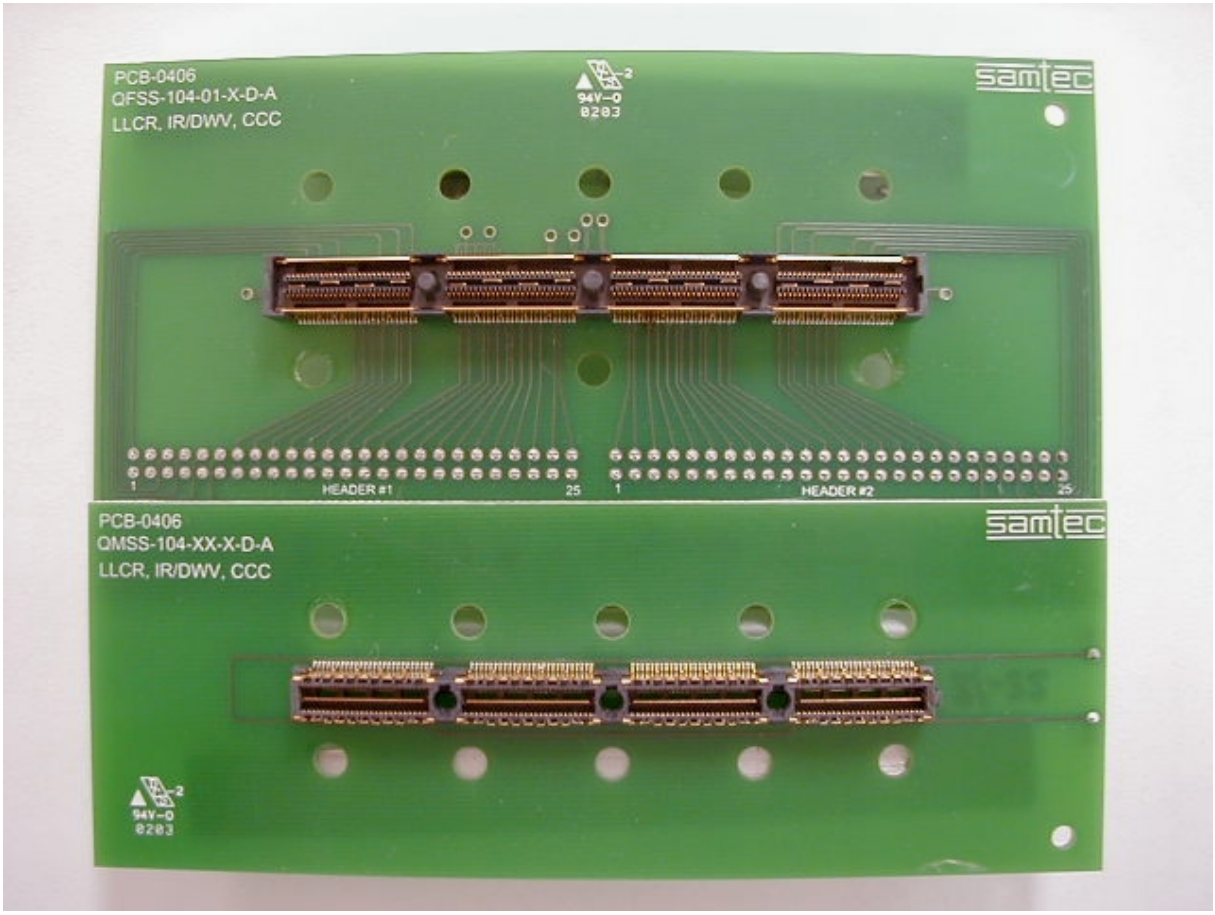
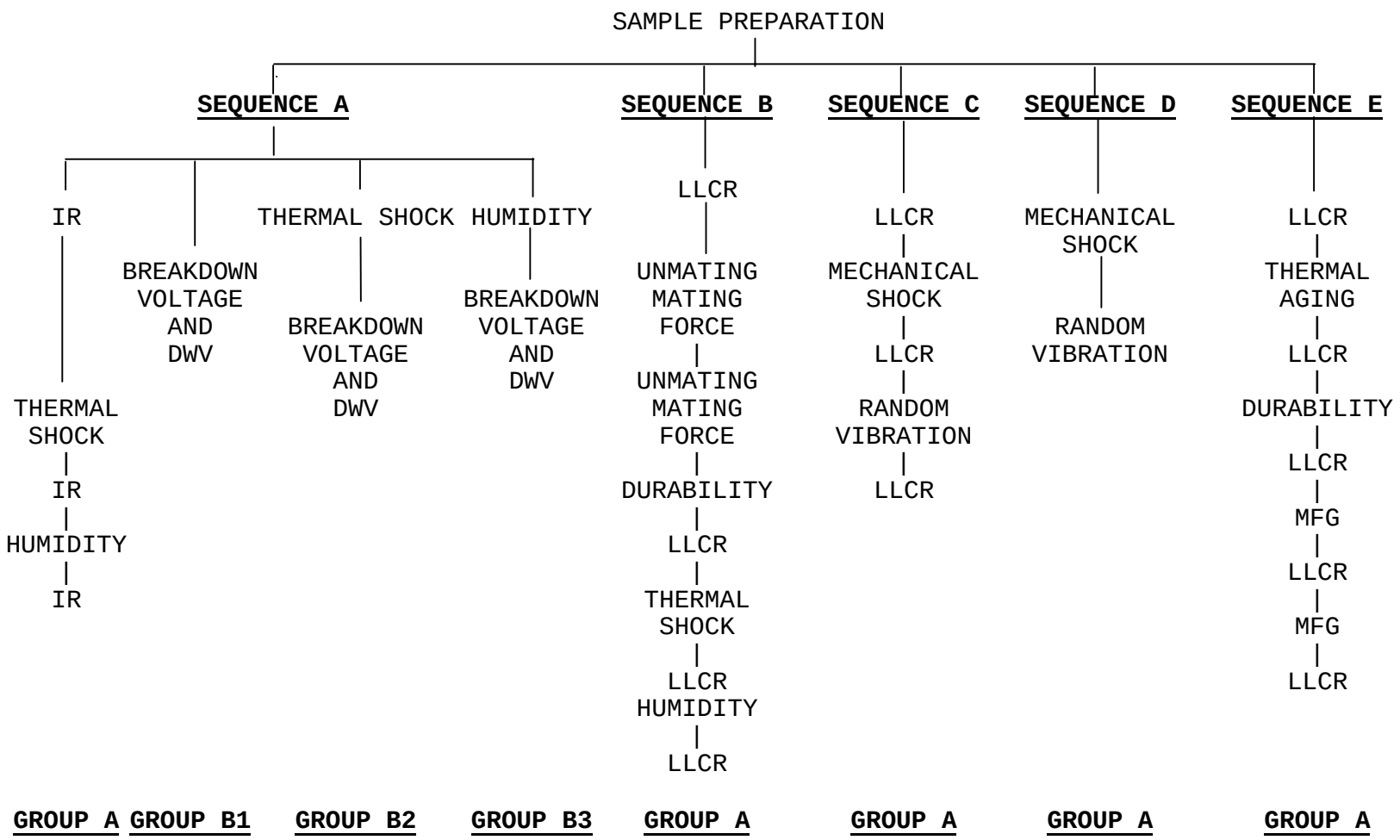

PCB-0406
QFSS-104-01-X-D-A
LLCR, IR/DWV, CCC
94V-0
0203
samtec
HEADER #1
HEADER #2
PCB-0406
QMSS-104-XX-X-D-A
LLCR, IR/DWV, CCC
samtec
94V-0
0203

FIGURE #2

TYPICAL TEST SAMPLE/TEST BOARD



DATA SUMMARY

TEST	REQUIREMENT	RESULTS
SEQUENCE A		
Group A		
Insulation Resistance	1000 Megohms Min.	>50000 Megohms
Thermal Shock	No Damage	Passed
Insulation Resistance	1000 Megohms Min.	>50000 Megohms
Humidity	No Damage	Passed
Insulation Resistance	1000 Megohms Min.	>25000 Megohms
Group B1		
Breakdown Voltage	Record Voltage	1200 VAC
DWV @ 75% of Breakdown Voltage	75% of VAC	900 VAC
Group B2		
Thermal Shock	No Damage	Passed
Breakdown Voltage	Record Voltage	1000 VAC
DWV @ 75% of Breakdown Voltage	75% of VAC	750 VAC
Group B3		
Humidity	No Damage	Passed
Breakdown Voltage	Record Voltage	1000 VAC
DWV @ 75% of Breakdown Voltage	75% of VAC	750 VAC
SEQUENCE B		
Group A		
LLCR	Record	27.4 mΩ Max.
Unmating Force	Record	13.4 lbs Max.
Mating Force	Record	14.8 lbs Max.
Durability	No Damage	Passed
LLCR	Record	+4.0 mΩ Max.Chg.
Thermal Shock	No Damage	Passed
LLCR	Record	+2.9 mΩ Max.Chg.
Humidity	No Damage	Passed
LLCR	Record	+3.1 mΩ Max.Chg.

DATA SUMMARY – Continued:

TEST	REQUIREMENT	RESULTS
SEQUENCE C		
Group A		
LLCR	Record	27.5 mΩ Max.
Mechanical Shock	No Damage	Passed
LLCR	Record	+1.9 mΩ Max.Chg.
Random Vibration	No Damage	Passed
LLCR	Record	+2.2 mΩ Max.Chg.
SEQUENCE D		
Group A		
Mechanical Shock	No Damage	Passed
	1.0 Microsecond	Passed
Random Vibration	No Damage	Passed
	1.0 Microsecond	Passed
SEQUENCE E		
Group A		
LLCR	Record	26.0 mΩ Max.
Thermal Aging	No Damage	Passed
LLCR	Record	+2.3 mΩ Max.Chg.
Durability	No Damage	Passed
LLCR	Record	+3.1 mΩ Max.Chg.
MFG (5 Days, Mated)	No Damage	Passed
LLCR	Record	+3.5 mΩ Max.Chg.
MFG (5 Days, Mated)	No Damage	Passed
LLCR	Record	+3.3 mΩ Max.Chg.

EQUIPMENT LIST

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
14	6/4/04	6/4/03	Accelero-meter	PCB Piezotronics	302A	7040	See Cal Cert	12mon
102	7/18/03	7/18/02	Data Acquisition Unit	Hewlett Packard	3421A	2338A02027	±. 5 %Of Indicated	12mon
150			Drill Press Stand	Craftsman	25921	N/A	N/A	N/A
192			Vertical Thermal Shock	Cincinnati Sub-Zero	VTS-1-5-3	88-11094	See Cal Cert	Each Test
208			Analyzer	Columbia Scientific	SA285E	JC006	See Manual	N/A
270			MFG Chamber	Contech Research	10 Cu Ft	N/A	N/A	Each Test
280	1/23/04	1/23/03	Micro-Ohm Meter	Keithley Instr.	580	477845	See Cal Cert	12mon
321	1/29/04	1/29/03	AC-DC Hipot/ Megometer	Hipotronics Co.	H300B	DS16-201	See Cal Cert	12 mon.
400			Computer	Kandu Co.	286-12	41353	N/A	N/A
436			Gas Regulator	Liquid Carboinc Co.	702-S-3	392838	N/A	N/A
443			Gas Regulator Valve	Liquid Carbonic Co.	DRK-2-48	40197	See Manual	N/A
465	6/25/04	6/25/03	Precision Resistor	Victoreen Co.	5000 Megohm	N/A	± 1 %	12 mon.
466	6/25/04	6/25/03	Precision Resistor	Victoreen Co.	50,000 mego	N/A	± 1 %	12 mon.
525			Gas Regulator	Superior Co.	5113A	350218	See Owners Manual	N/A
526			Gas Regulator	Matheson Co.	3813-330	R93172	See Owners Manual	N/A
543	1/21/04	1/21/03	Analytical Balance	Ohaus Co.	AP250D	MO9198	± .4mg	12mon
545	9/23/03	9/23/02	Event Detector	Anatech	32/64 EHD	941206	See Cal Cert	12mon
553	12/6/03	12/6/02	12 channel Power Unit	PCB Co.	483A	1303	See Cal Cert	12mon
599			Printer	Brother	HL-630	B66729516	N/A	N/A
620	10/16/03	10/16/02	Accelerometer	PCB	A353B15	34197	See Cal. Cert	12mon
663	9/20/03	9/20/02	Digital Multimeter	Fluke Co.	75	68420599	See Cal Cert	12mon
681			Computer	ARC Co.	P166	N/A	N/A	N/A
1014	9/17/03	3/17/03	Temp. Humid. Transmitter	General Eastern	850-232-5	00378	± 2%RH	6mon
1027			Computer	ARC Co.	Pent.133	026871	N/A	N/A
1028	11/8/03	11/8/02	Event Detector	Analysis Tech	32 EHD	981019	See Cal.Cert.	12mon

EQUIPMENT LIST – Continued:

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
1041	1/24/04	1/24/03	Force Gage	Chatillon	DFIS-50	B34054	± .15%	12mon
1045	6/16/04	6/16/03	Microohm Meter	Keithley	580	708216	See Cal Cert	12mon
1047	10/29/03	10/29/02	Microohm Meter	Keithley	580	0705731	See Cal Cert	12mon
1106			Elect.Liquid Level Control	Cole Parmer	7187	16569	N/A	N/A
1166	3/31/04	3/31/03	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
1230			Temp-humid-Chamber	Blue M.	FRM-256B	FRM277	See Manual	Each Test
1239			Bench Oven	Blue M.	ESP400C-5	ESP-1229	See Manual	Each Test
1271			Amplifier	Unholtz Dickie	SA15	3483	See Manual	N/A
1272			Shaker Table	Unholtz Dickie	S202PB	263	N/A	N/A
1296			MFG Control Panel	Contech Research	N/A	N/A	N/A	N/A
1317			X-Y Table	Contech Research	CR-XY	01	N/A	N/A
1323			Air Dryer	Balston	75-20	7520-1076	N/A	N/A
1334			Oxident Moniter	Mast	724-5	2923	See Manual	N/A
1360	11/14/03	5/14/03	Data Acquisition Multimeter	Keithley	2700	0914136	See Cal Cert	6mon
1361	11/14/03	5/14/03	Multiplexer Card	Keithley	7708	1067661	See Cal Cert	6mon

TEST RESULTS

SEQUENCE A

Group A

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE: ID# A-A-1,A-A-2, A-A-3	TECHNICIAN: SR
START DATE: 5/10/03	COMPLETE DATE: 5/10/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 49%
EQUIPMENT ID#: 321, 465, 466	

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 1000 megohms.

RESULTS:

The insulation resistance exceeded 50000 megohms.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE: ID# A-A-1,A-A-2, A-A-3	TECHNICIAN: MHB
START DATE: 5/23/03	COMPLETE DATE: 5/28/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 48%
EQUIPMENT ID#: 192, 321, 465, 466, 1360, 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 +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.

REQUIREMENTS:

1. There shall be no evidence of physical damage or deterioration of the test samples so exposed.

2. The insulation resistance shall exceed 1000 megohms.

RESULTS:

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

2. The insulation resistance was in excess of 50000 megohms.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE: ID# A-A-1,A-A-2, A-A-3	TECHNICIAN: MHB
START DATE: 5/30/03	COMPLETE DATE: 6/9/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 34%
EQUIPMENT ID#: 321, 465, 466, 1230, 1360, 1361	

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 1000 megohms.

RESULTS:

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

2. The final insulation resistance exceeded 25000 megohms.

TEST RESULTS

SEQUENCE A

Group B1

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE: ID# A-B1-1,A-B1-2, A-B1-3	TECHNICIAN: MHB
START DATE: 5/10/03	COMPLETE DATE: 5/10/03
ROOM AMBIENT: 29°C	RELATIVE HUMIDITY: 40%
EQUIPMENT ID#: 321	

DIELECTRIC WITHSTANDING VOLTAGE (SEA LEVEL)

PURPOSE:

To determine the voltage at which dielectric breakdown occurs.

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.

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

4. Sample ID# A-B1-3 was used to determine the breakdown voltage. Sample ID #’s A-B1-1 and A-B1-2 were subsequently tested at 75% of the breakdown voltage.

REQUIREMENTS:

1. The voltage at which dielectric breakdown occurs shall be measured and recorded.

REQUIREMENTS: Continued

2. When 75% of the breakdown voltage is applied to previously untested samples, there shall be no evidence of breakdown, arcing, etc.

RESULTS:

1. The voltage at which dielectric breakdown occurred 1200 VAC.

2. No dielectric breakdown occurred on the separate test samples when tested at 75% of the breakdown voltage. The test voltage was 900 VAC.

TEST RESULTS

SEQUENCE A

Group B2

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE: ID# A-B2-1,A-B2-2, A-B2-3	TECHNICIAN: MHB
START DATE: 5/23/03	COMPLETE DATE: 5/28/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 48%
EQUIPMENT ID#: 192, 321, 1360, 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 +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.

PROCEDURE: Continued

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

7. Sample ID# A-B2-3 was used to determine the breakdown voltage. Sample ID# A-B2-1 and A-B2-2 were subsequently tested at 75% of the breakdown voltage.

REQUIREMENTS:

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

2. The dielectric breakdown voltage shall be measured and recorded.

3. When 75% of the breakdown voltage is applied to previously untested samples, there shall be no evidence of breakdown, arcing, etc.

RESULTS:

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

2. The voltage at which dielectric breakdown occurred was 1000 VAC.

3. No dielectric breakdown occurred on the separate test samples when tested at 75% of the breakdown voltage. The test voltage was 750 VAC.

TEST RESULTS

SEQUENCE A

Group B3

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE: ID# A-B3-1,A-B3-2, A-B3-3	TECHNICIAN: MHB
START DATE: 5/13/03	COMPLETE DATE: 5/23/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 50%
EQUIPMENT ID#: 321, 1230, 1360, 1361	

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

4. Sample ID# A-B3-3 was used to determine the breakdown voltage. Sample ID #'s A-B3-1 and A-B3-2 were subsequently tested at 75% of the breakdown voltage.

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

REQUIREMENTS:

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

2. The voltage at which dielectric breakdown occurs shall be measured and recorded.

3. When 75% of the breakdown voltage is applied to previously untested samples, there shall be no evidence of breakdown, arcing, etc.

RESULTS:

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

2. The voltage at which dielectric breakdown occurred was 1000 VAC.

3. No dielectric breakdown occurred on the separate test samples when tested at 75% of the breakdown voltage. The test voltage was 750 VAC.

TEST RESULTS

SEQUENCE B

Group A

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# B-A-1,B-A-2, B-A-3,B-A-4,B-A-5, B-A-6,B-A-7,B-A-8	TECHNICIAN: MHB
START DATE: 5/20/03	COMPLETE DATE: 5/20/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 43%
EQUIPMENT ID#: 681, 1045	

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:

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 #3.

REQUIREMENTS:

Low level circuit resistance shall be measured and recorded.

RESULTS:

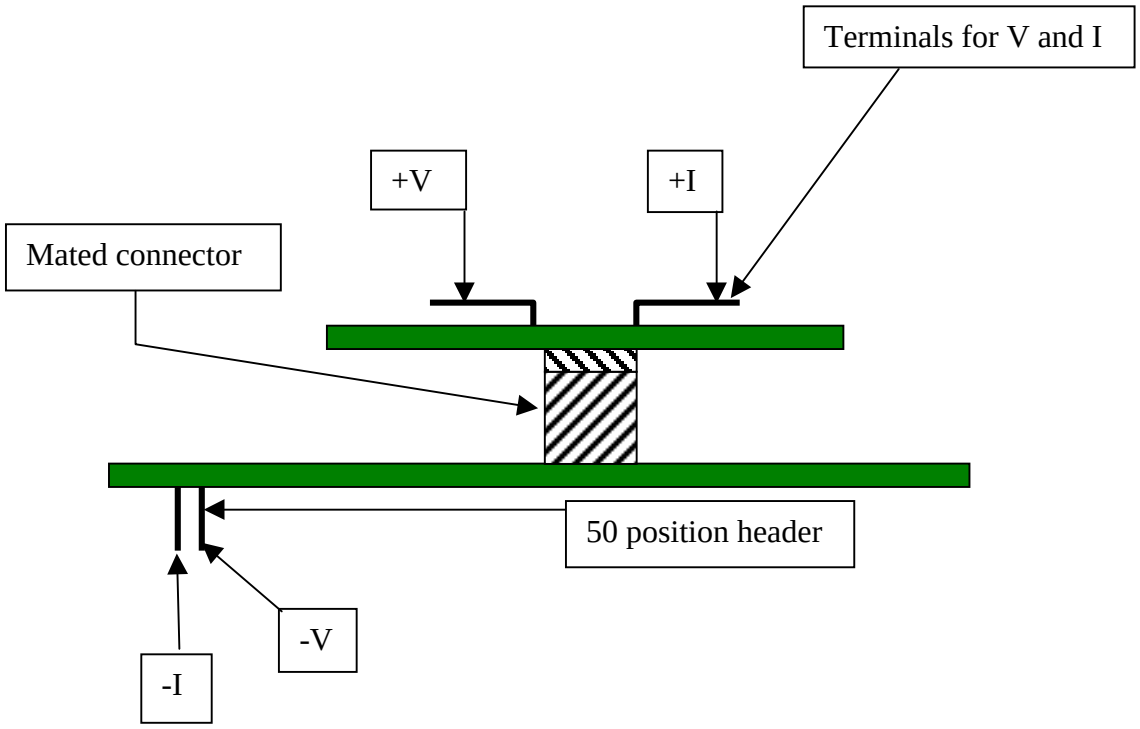
1. The following is a summary of the data observed:

LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg.	Max.	Min.
B-A-1	25.5	26.8	23.5
B-A-2	25.1	27.4	23.7
B-A-3	25.2	26.9	22.8
B-A-4	25.3	26.9	22.8
B-A-5	24.9	26.3	23.1
B-A-6	25.1	26.3	23.3
B-A-7	24.2	26.6	22.6
B-A-8	24.8	26.5	22.7

2. See data files 20318301 through 20318308 for individual data points.

FIGURE #3


Terminals for V and I
+V
+I
Mated connector
50 position header
-V
-I

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# B-A-1,B-A-2, B-A-3,B-A-4,B-A-5, B-A-6,B-A-7,B-A-8	TECHNICIAN: MHB
START DATE: 5/21/03	COMPLETE DATE: 5/21/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 45%
EQUIPMENT ID#: 150, 1041, 1317	

MATING AND UNMATING FORCE

PURPOSE:

To determine the mechanical forces required to mate and unmate the connectors.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 13.

2. The test samples were fixtured to the base plate of the test stand and applicable force gauge.

3. The fixturing was accomplished in a manner to prevent “bowing” of the test samples during the performance of the test.

4. The fixturing was accomplished to assure axial alignment and allowed self centering movement to exist.

5. Care was taken to assure that the mating faces did not contact each other to assure proper forces were measured.

6. The test rate was 1.0 inch per minute.

REQUIREMENTS: See next page.

REQUIREMENTS:

The force required to mate and unmate the connectors shall be measured and recorded.

RESULTS:

The following is a summary of the observed data:

Sample ID#	UNMATING FORCE (Pounds)	MATING FORCE (Pounds)
B-A-1,2	10.8	14.8
B-A-3,4	11.6	13.1
B-A-5,6	11.2	12.3
B-A-7,8	13.4	14.6

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# B-A-1,B-A-2, B-A-3,B-A-4,B-A-5, B-A-6,B-A-7,B-A-8	TECHNICIAN: MHB
START DATE: 5/21/03	COMPLETE DATE: 5/22/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 48%
EQUIPMENT ID#: 150, 681, 1045, 1317	

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 per hour

3. The test samples were assembled to special holding devices and attached to the manual cycling equipment utilizing constant speed control and counter systems.

PROCEDURE: Continued

4. The test samples were axially aligned to accomplish the mating and unmating function allowing for self-centering movement.

5. Care was taken to prevent the mating faces of the test samples from contacting each other.

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

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples so tested.

2. The low level circuit resistance shall be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
B-A-1	-0.3	+1.6
B-A-2	-0.3	+2.2
B-A-3	-0.1	+1.8
B-A-4	-0.6	+1.0
B-A-5	+0.0	+2.0
B-A-6	-0.2	+2.2
B-A-7	+0.1	+3.0
B-A-8	+0.0	+4.0

3. See data files 20318301 through 20318308 for individual data points.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# B-A-1,B-A-2, B-A-3,B-A-4,B-A-5, B-A-6,B-A-7,B-A-8	TECHNICIAN: MHB
START DATE: 5/23/03	COMPLETE DATE: 5/28/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 48%
EQUIPMENT ID#: 192, 681, 1045, 1360, 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 +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.

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 be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
B-A-1	+0.0	+1.4
B-A-2	+0.2	+2.9
B-A-3	+0.2	+1.2
B-A-4	+0.3	+2.0
B-A-5	+0.3	+2.0
B-A-6	+0.3	+1.8
B-A-7	+0.7	+2.9
B-A-8	+0.1	+2.7

3. See data files 20318301 through 20318308 for individual data points.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# B-A-1,B-A-2, B-A-3,B-A-4,B-A-5, B-A-6,B-A-7,B-A-8	TECHNICIAN: MHB/KMc
START DATE: 5/30/03	COMPLETE DATE: 6/9/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 58%
EQUIPMENT ID#: 681, 1045, 1230, 1360, 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, Method II 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 be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
B-A-1	+0.0	+1.7
B-A-2	+0.1	+1.5
B-A-3	+0.0	+1.4
B-A-4	+0.0	+1.1
B-A-5	+0.3	+1.9
B-A-6	+0.3	+1.1
B-A-7	+0.7	+3.1
B-A-8	+0.0	+2.5

3. See data files 20318301 through 203018308 for individual data points.

LLCR DATA FILES

DATA FILE NUMBERS

20318301
20318302
20318303
20318304
20318305
20318306
20318307
20318308

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318301	
	Description:	Sample ID# B-A-1						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	24.5	-1.1	-1.1	-1.3			
	2	24.5	1.6	1.2	0.0			
	3	26.8	-2.4	-2.2	-1.4			
	4	25.0	-1.7	-0.4	-0.3			
	5	25.4	-2.7	-1.4	-1.1			
	6	24.8	1.5	1.1	-2.1			
	7	26.5	0.2	-0.3	-0.7			
	8	26.1	-0.1	-1.4	0.3			
	9	25.5	0.2	0.4	-0.2			
	10	25.0	0.6	0.2	0.9			
	11	26.4	-0.9	-0.9	-0.6			
	12	26.0	-1.1	-0.5	-1.0			
	13	25.8	-1.0	-0.8	-1.0			
	14	25.0	-0.2	-0.2	0.0			
	15	24.6	0.1	0.5	0.9			
	16	25.1	0.7	1.0	1.3			
	17	25.6	0.2	0.9	1.4			
	18	25.4	0.2	0.4	0.1			
	19	26.6	-0.6	-0.7	-0.2			
	20	26.1	0.2	-0.5	0.3			
	21	26.4	-0.4	-0.2	-0.2			
	22	25.5	-0.4	1.0	1.6			
	23	25.4	-0.3	0.5	0.0			
	24	25.2	-0.6	0.7	0.3			
	25	23.5	1.0	1.4	1.7			
	MAX	26.8	1.6	1.4	1.7			
	MIN	23.5	-2.7	-2.2	-2.1			
	AVG	25.5	-0.3	0.0	0.0			
	STD	0.8	1.0	1.0	1.0			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318302	
	Description:	Sample ID# B-A-2						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	23.8	1.4	0.7	1.0			
	2	24.7	0.9	0.5	1.1			
	3	25.4	-0.8	0.1	-0.2			
	4	24.6	0.3	0.6	0.4			
	5	25.4	-0.4	0.0	-0.4			
	6	25.3	-0.3	-0.8	-0.4			
	7	25.2	-0.1	-0.5	0.1			
	8	25.4	-0.7	0.5	-0.8			
	9	24.9	-0.8	0.6	0.3			
	10	24.7	0.3	1.0	-0.3			
	11	24.0	2.2	2.9	1.0			
	12	23.9	1.0	1.0	1.5			
	13	23.7	1.5	0.9	1.4			
	14	24.1	1.8	1.0	1.2			
	15	24.5	1.6	1.1	1.1			
	16	26.0	1.3	0.6	0.2			
	17	27.0	0.7	-0.1	0.7			
	18	27.4	-1.7	-0.5	-0.4			
	19	26.2	-4.0	-0.5	-0.1			
	20	24.4	-2.0	-0.7	-1.2			
	21	24.2	0.4	0.5	0.5			
	22	26.0	-1.4	0.5	0.0			
	23	25.4	-2.2	-0.2	0.2			
	24	26.5	-3.5	-1.9	-1.6			
	25	25.6	-2.6	-0.9	-2.3			
	MAX	27.4	2.2	2.9	1.5			
	MIN	23.7	-4.0	-1.9	-2.3			
	AVG	25.1	-0.3	0.2	0.1			
	STD	1.0	1.7	0.9	0.9			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318303	
	Description:	Sample ID# B-A-3						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	23.9	0.6	1.1	-0.2			
	2	25.0	-0.3	0.0	-0.1			
	3	25.8	-0.3	-0.6	-0.8			
	4	26.4	-1.4	-0.4	-0.6			
	5	25.4	-1.9	0.1	0.1			
	6	24.6	1.4	-0.2	-1.1			
	7	26.1	0.5	-0.1	-1.1			
	8	26.0	0.7	-0.5	-0.4			
	9	26.3	-0.7	0.3	-1.1			
	10	25.3	-1.6	0.6	-0.2			
	11	24.4	1.6	1.0	1.0			
	12	24.6	-0.8	0.5	0.8			
	13	23.9	1.8	1.0	0.7			
	14	24.3	-0.9	1.2	1.4			
	15	23.9	1.8	1.1	0.8			
	16	25.4	0.0	0.3	0.2			
	17	25.3	0.6	1.1	0.3			
	18	26.9	-1.3	-1.5	-1.1			
	19	26.4	0.1	-1.1	-0.8			
	20	26.0	0.1	-0.5	0.0			
	21	26.0	0.3	-0.2	-0.2			
	22	25.6	-0.1	0.3	0.0			
	23	25.2	-0.9	-0.3	-0.2			
	24	24.3	-1.9	0.6	0.4			
	25	22.8	-0.5	1.1	0.9			
	MAX	26.9	1.8	1.2	1.4			
	MIN	22.8	-1.9	-1.5	-1.1			
	AVG	25.2	-0.1	0.2	0.0			
	STD	1.0	1.1	0.7	0.7			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318304	
	Description:	Sample ID# B-A-4						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	25.0	-0.8	0.9	0.3			
	2	24.9	0.1	1.0	1.0			
	3	25.3	-1.3	0.2	-0.1			
	4	26.8	-0.4	-1.4	-1.8			
	5	26.0	0.5	-1.1	-0.7			
	6	26.6	-1.3	0.4	-0.8			
	7	26.0	-0.7	-0.6	-0.8			
	8	26.2	-1.8	-0.6	-0.6			
	9	26.2	-1.0	0.0	-0.4			
	10	25.9	-3.7	0.3	0.1			
	11	22.8	0.4	1.3	1.0			
	12	23.9	0.0	2.0	0.4			
	13	24.1	-0.5	0.3	-0.1			
	14	24.5	-0.9	0.2	0.1			
	15	24.7	0.3	1.0	0.5			
	16	25.8	0.0	-0.1	0.3			
	17	26.1	1.0	0.7	0.2			
	18	26.9	-0.6	-0.9	-0.3			
	19	26.3	-1.8	0.9	1.0			
	20	24.9	-0.5	0.8	-0.3			
	21	25.1	0.2	0.1	0.3			
	22	25.7	-0.5	-0.1	0.0			
	23	26.2	-2.2	-0.8	-0.6			
	24	23.4	0.8	0.2	1.1			
	25	23.3	0.9	1.6	0.9			
	MAX	26.9	1.0	2.0	1.1			
	MIN	22.8	-3.7	-1.4	-1.8			
	AVG	25.3	-0.6	0.3	0.0			
	STD	1.1	1.1	0.9	0.7			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318305	
	Description:	Sample ID# B-A-5						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	23.1	-0.3	1.2	0.7			
	2	24.0	0.3	0.9	1.2			
	3	25.0	0.2	0.4	0.2			
	4	25.4	-1.4	0.0	-0.1			
	5	24.9	-1.9	0.0	-0.5			
	6	24.2	2.0	-0.7	-0.6			
	7	26.3	-0.6	-0.6	-1.0			
	8	25.8	0.0	-0.6	-0.3			
	9	25.3	-0.2	-0.1	0.0			
	10	25.1	-0.9	-0.9	-0.2			
	11	24.7	-0.7	0.0	0.2			
	12	23.8	0.2	0.8	0.4			
	13	24.2	0.4	0.5	0.7			
	14	24.4	0.3	-0.2	0.3			
	15	24.2	1.4	1.8	1.4			
	16	25.8	-0.2	-0.1	0.5			
	17	25.7	-0.5	1.2	0.5			
	18	24.9	1.1	0.3	0.6			
	19	25.7	-0.1	1.2	0.3			
	20	25.6	0.4	0.0	-0.1			
	21	26.2	-0.4	-0.4	-0.5			
	22	25.5	-0.2	0.7	0.6			
	23	23.4	1.1	2.0	1.9			
	24	24.7	-0.1	-0.2	0.0			
	25	24.6	-0.1	0.3	0.1			
	MAX	26.3	2.0	2.0	1.9			
	MIN	23.1	-1.9	-0.9	-1.0			
	AVG	24.9	0.0	0.3	0.3			
	STD	0.9	0.8	0.8	0.6			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318306	
	Description:	Sample ID# B-A-6						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	24.8	-0.2	0.1	0.4			
	2	24.5	1.7	1.4	0.5			
	3	25.9	-0.4	-0.2	0.7			
	4	25.5	1.0	0.2	0.6			
	5	25.7	0.5	0.6	0.7			
	6	25.9	-0.4	0.3	0.3			
	7	25.4	1.0	1.1	0.6			
	8	26.1	-0.5	0.8	0.9			
	9	25.1	-0.5	0.0	0.6			
	10	25.1	-1.3	-0.5	0.7			
	11	24.1	-0.4	0.0	0.5			
	12	24.1	0.6	0.4	0.3			
	13	24.9	-0.7	-0.2	-0.3			
	14	24.2	0.2	0.9	1.1			
	15	24.5	1.0	1.0	0.2			
	16	25.6	0.3	-0.2	0.3			
	17	26.3	-0.8	-0.9	-0.6			
	18	25.9	-0.7	0.0	0.3			
	19	25.6	-2.4	-0.4	-0.1			
	20	23.3	0.6	1.7	-0.1			
	21	23.4	2.2	1.8	1.0			
	22	25.5	0.1	-0.4	-0.2			
	23	25.9	-2.0	0.3	0.1			
	24	24.8	-0.8	0.2	0.2			
	25	25.7	-1.8	-1.7	-2.0			
	MAX	26.3	2.2	1.8	1.1			
	MIN	23.3	-2.4	-1.7	-2.0			
	AVG	25.1	-0.2	0.3	0.3			
	STD	0.8	1.1	0.8	0.6			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318307	
	Description:	Sample ID# B-A-7						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	26.6	-1.6	-0.9	-1.4			
	2	24.7	-0.4	0.3	0.8			
	3	26.0	-1.4	-0.6	-0.4			
	4	26.2	-1.5	0.5	0.8			
	5	23.4	-0.5	0.8	0.1			
	6	23.8	-2.1	0.2	-0.6			
	7	24.2	0.4	0.8	0.9			
	8	24.8	0.8	1.1	1.8			
	9	24.2	0.3	1.0	0.7			
	10	24.5	1.1	1.3	1.7			
	11	23.2	0.6	1.4	1.2			
	12	22.6	0.9	1.3	1.2			
	13	22.6	3.0	2.6	2.9			
	14	23.3	0.9	1.6	1.2			
	15	23.1	0.1	0.5	0.1			
	16	24.6	0.0	-0.1	0.0			
	17	24.1	0.8	1.4	0.8			
	18	24.8	-0.2	-0.6	0.0			
	19	24.2	0.1	0.5	0.5			
	20	25.0	0.1	0.2	0.2			
	21	24.8	0.3	0.7	0.2			
	22	25.2	-0.7	0.0	0.2			
	23	24.2	-0.2	-0.3	-0.4			
	24	23.5	0.8	1.1	1.5			
	25	22.6	0.8	2.9	3.1			
	MAX	26.6	3.0	2.9	3.1			
	MIN	22.6	-2.1	-0.9	-1.4			
	AVG	24.2	0.1	0.7	0.7			
	STD	1.1	1.1	0.9	1.0			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. B	
	Product:	Series QMSS/QFss connector				File #:	20318308	
	Description:	Sample ID# B-A-8						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20	20			
	R.H. %	43	48	48	58			
	Date:	20May03	23May03	28May03	09Jun03			
	Pos. ID	Initial	Dura	T.Shock	Humidity			
	1	23.7	0.3	0.5	0.7			
	2	23.2	0.2	0.2	0.2			
	3	25.2	-0.4	-0.5	-0.1			
	4	24.7	0.1	-0.1	-0.4			
	5	25.9	-0.3	-0.1	-0.7			
	6	25.6	-0.1	-0.4	-0.3			
	7	26.3	0.5	-0.4	-0.1			
	8	25.7	-0.1	-0.6	-0.2			
	9	24.6	1.0	0.1	0.7			
	10	25.1	-1.0	-0.5	-0.6			
	11	22.7	2.5	2.7	2.4			
	12	22.8	4.0	2.4	2.5			
	13	23.8	0.7	0.9	0.2			
	14	23.5	1.1	1.5	1.1			
	15	23.2	1.1	1.0	0.9			
	16	25.7	0.4	-0.4	0.2			
	17	26.3	0.2	0.1	-0.1			
	18	26.5	1.9	2.2	0.6			
	19	25.5	1.8	0.5	0.6			
	20	24.9	-3.1	-2.0	-1.9			
	21	24.6	-2.8	-2.2	-0.5			
	22	26.1	-2.0	-2.4	-1.6			
	23	25.2	-1.7	-0.7	-1.1			
	24	24.3	-2.1	0.3	-1.2			
	25	23.8	-2.4	0.2	-1.2			
	MAX	26.5	4.0	2.7	2.5			
	MIN	22.7	-3.1	-2.4	-1.9			
	AVG	24.8	0.0	0.1	0.0			
	STD	1.2	1.7	1.3	1.1			
	Open	0	0	0	0			
	Tech	MHB	MHB	MHB	KMc			
	Equip ID	681	681	681	681			
		1045	1045	1045	1045			

TEST RESULTS

SEQUENCE C

Group A

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# C-A-9,C-A-10, C-A-11,C-A-12,C-A-13, C-A-14,C-A-15,C-A-16	TECHNICIAN: MHB
START DATE: 5/20/03	COMPLETE DATE: 5/20/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 43%
EQUIPMENT ID#: 681, 1045	

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:

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 #3.

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-9	25.4	26.9	23.4
C-A-10	24.9	26.6	22.9
C-A-11	25.1	26.5	22.3
C-A-12	25.1	26.8	23.2
C-A-13	25.4	27.0	23.8
C-A-14	25.5	27.5	24.0
C-A-15	25.0	26.2	23.9
C-A-16	25.2	26.2	24.1

2. See data files 20318309 through 20318316 for individual data points.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# C-A-9,C-A-10, C-A-11,C-A-12,C-A-13, C-A-14,C-A-15,C-A-16	TECHNICIAN: MHB
START DATE: 5/28/03	COMPLETE DATE: 5/28/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 50%
EQUIPMENT ID#: 14, 553, 599, 681, 1045, 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 : Sawtooth
    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 #4 illustrates the test sample fixturing utilized during the test.

REQUIREMENTS:

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

REQUIREMENTS: Continued

2. The change in low level circuit resistance be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
C-A-9	-0.3	+0.8
C-A-10	-0.2	+1.2
C-A-11	+0.2	+1.1
C-A-12	-0.1	+0.5
C-A-13	+0.1	+1.9
C-A-14	+0.1	+0.9
C-A-15	+0.2	+0.9
C-A-16	+0.2	+0.9

3. See data files 20318309 through 20318316 for individual data points.

4. The Mechanical Shock characteristics are shown in Figures #5 (Calibration Pulse) and #6 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

FIGURE #4

TYPICAL MECHANICAL SHOCK
RANDOM VIBRATION SET-UP

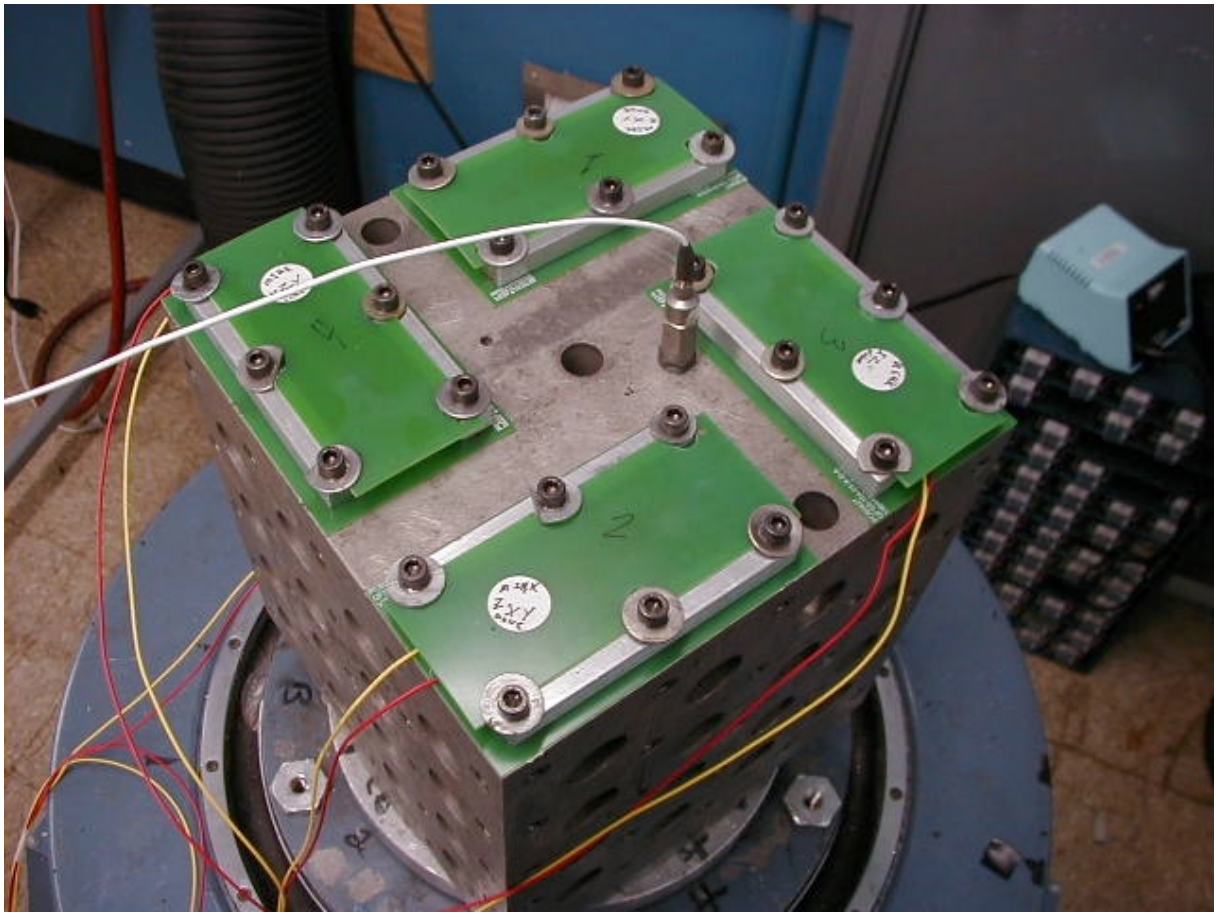
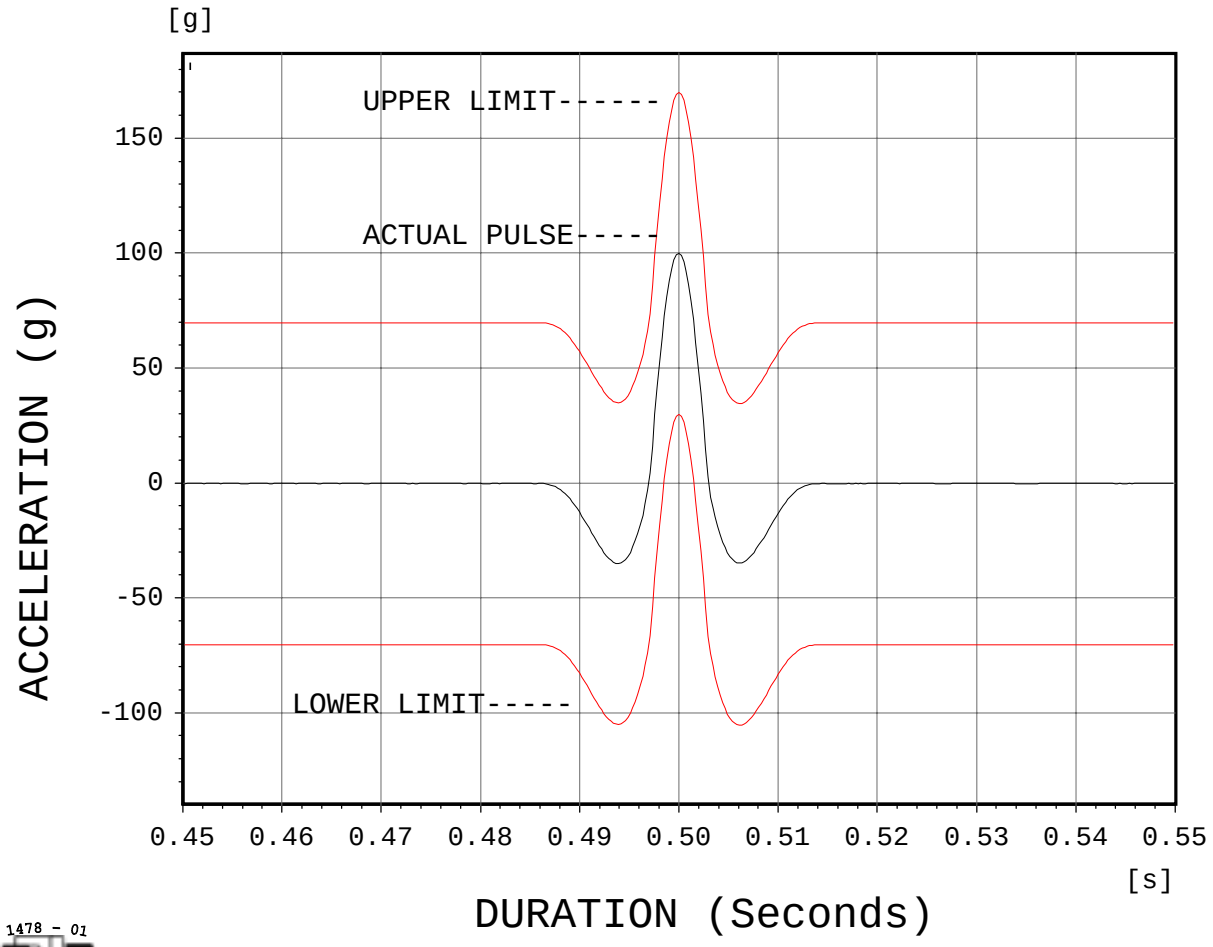


FIGURE #5

Classical Shock

Channel 1



Project 203183
Cal Wave 1
Date:28May03
Tech: /MHB
Seq. C

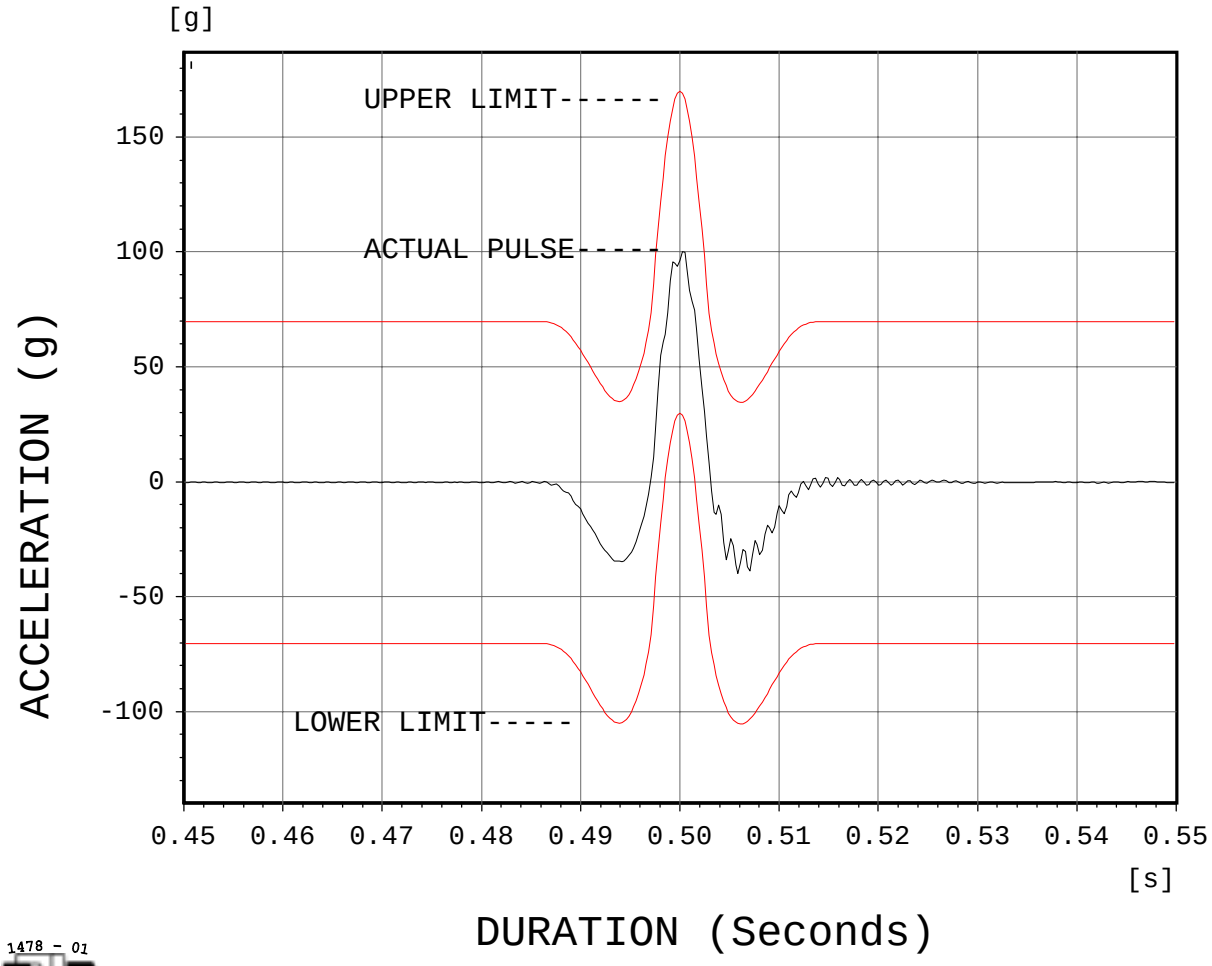
1478 - 01
ACCREDITED
1478 - 02

Contech Research

FIGURE #6

Classical Shock

Channel 1



Project 203183
Actual Wave
Date: 28May03
Tech: /MHB
Seq. C

1478 - 01
1478 - 02

Contech Research

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# C-A-9,C-A-10, C-A-11,C-A-12,C-A-13, C-A-14,C-A-15,C-A-16	TECHNICIAN: MHB
START DATE: 5/28/03	COMPLETE DATE: 6/2/03
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 48%
EQUIPMENT ID#: 14, 599, 553, 681, 1045, 1166, 1167, 1168, 1169, 1271, 1272	

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

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

REQUIREMENTS:

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

2. The change in low level circuit resistance shall be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
C-A-9	-0.4	+1.2
C-A-10	-0.5	+1.4
C-A-11	+0.5	+1.9
C-A-12	+0.2	+0.8
C-A-13	-0.1	+2.2
C-A-14	+0.2	+1.6
C-A-15	+0.3	+0.9
C-A-16	+0.2	+1.3

3. See data files 20318309 through 20318316 for individual data points.

LLCR DATA FILES

DATA FILE NUMBERS

20318309
20318310
20318311
20318312
20318313
20318314
20318315
20318316

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq.C	
	Product:	Series QMSS/QFss connector				File #:	20318309	
	Description:	Sample ID# C-A-9						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	23.5	-1.3	-1.5				
	2	24.7	-1.4	-1.2				
	3	25.7	-0.4	-1.5				
	4	25.9	-0.8	-0.9				
	5	24.2	-0.1	-0.5				
	6	23.8	-0.4	-1.0				
	7	26.4	0.0	0.3				
	8	26.4	0.3	0.3				
	9	26.8	0.1	0.4				
	10	26.9	-0.4	-0.2				
	11	24.8	0.1	0.7				
	12	24.3	0.8	1.2				
	13	24.2	0.0	0.2				
	14	24.8	0.1	0.0				
	15	25.0	0.0	-0.4				
	16	26.2	-0.1	-0.6				
	17	26.3	-0.4	-0.1				
	18	26.5	-0.4	-0.7				
	19	26.9	-0.4	-0.7				
	20	26.9	-0.5	-0.4				
	21	25.9	-0.3	-0.6				
	22	23.4	-0.5	-0.5				
	23	26.3	-0.8	-1.0				
	24	24.5	0.2	-0.3				
	25	24.4	-0.5	-0.4				
	MAX	26.9	0.8	1.2				
	MIN	23.4	-1.4	-1.5				
	AVG	25.4	-0.3	-0.4				
	STD	1.1	0.5	0.7				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318310	
	Description:	Sample ID# C-A-10						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	23.9	0.1	0.0				
	2	24.2	-0.1	-0.3				
	3	26.6	-0.9	-1.2				
	4	25.7	-0.5	-1.1				
	5	25.6	-0.4	-0.6				
	6	25.9	-0.4	-0.9				
	7	25.6	-0.1	-0.5				
	8	26.3	-1.0	-1.9				
	9	25.3	-0.5	-0.9				
	10	24.6	-0.4	-0.6				
	11	22.9	0.2	-0.4				
	12	24.1	-0.2	-1.5				
	13	24.1	-0.2	-1.4				
	14	23.4	-0.5	-1.2				
	15	24.1	-0.1	-1.5				
	16	25.0	-0.7	-1.1				
	17	24.8	-0.2	-0.7				
	18	25.8	-0.9	-1.5				
	19	25.6	-0.1	-1.1				
	20	24.5	-0.1	1.3				
	21	23.9	0.3	1.4				
	22	24.9	0.5	0.9				
	23	25.6	0.1	0.7				
	24	24.6	1.2	1.3				
	25	24.9	0.5	1.3				
	MAX	26.6	1.2	1.4				
	MIN	22.9	-1.0	-1.9				
	AVG	24.9	-0.2	-0.5				
	STD	0.9	0.5	1.0				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318311	
	Description:	Sample ID# C-A-11						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	23.6	0.1	-1.6				
	2	23.9	0.2	-0.1				
	3	25.0	0.3	0.5				
	4	25.4	0.5	0.3				
	5	23.8	0.2	-0.3				
	6	22.3	0.2	-0.3				
	7	26.4	0.1	0.9				
	8	26.0	0.5	1.1				
	9	25.3	1.1	1.9				
	10	25.8	0.4	1.2				
	11	25.2	0.0	0.6				
	12	24.0	0.3	0.8				
	13	24.8	0.3	1.3				
	14	25.1	0.2	0.4				
	15	24.0	0.1	0.8				
	16	25.2	0.4	0.8				
	17	26.2	-0.3	0.4				
	18	25.6	-0.5	-0.2				
	19	26.4	0.1	0.6				
	20	26.4	0.0	0.1				
	21	26.5	0.0	0.7				
	22	26.2	0.2	0.6				
	23	24.7	0.2	0.4				
	24	24.1	0.0	0.2				
	25	24.5	0.2	1.7				
	MAX	26.5	1.1	1.9				
	MIN	22.3	-0.5	-1.6				
	AVG	25.1	0.2	0.5				
	STD	1.1	0.3	0.7				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318312	
	Description:	Sample ID# C-A-12						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	24.0	0.1	0.3				
	2	24.1	0.2	0.2				
	3	25.4	0.0	0.2				
	4	25.2	0.2	0.4				
	5	26.3	-0.1	0.7				
	6	25.8	-0.1	0.4				
	7	25.9	0.2	0.8				
	8	26.0	-0.4	0.0				
	9	23.2	0.2	0.5				
	10	24.9	0.1	0.4				
	11	24.2	0.5	0.5				
	12	25.4	-0.1	-0.3				
	13	24.9	0.0	-0.1				
	14	24.8	0.1	0.1				
	15	24.3	0.0	0.1				
	16	25.5	0.2	0.3				
	17	26.8	-0.5	0.0				
	18	26.4	-0.1	0.0				
	19	26.8	-0.4	-0.4				
	20	23.8	-0.4	0.1				
	21	23.6	-0.4	-0.1				
	22	25.0	-0.1	0.1				
	23	25.6	0.2	0.4				
	24	24.2	-0.1	0.3				
	25	24.8	-0.7	0.7				
	MAX	26.8	0.5	0.8				
	MIN	23.2	-0.7	-0.4				
	AVG	25.1	-0.1	0.2				
	STD	1.0	0.3	0.3				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318313	
	Description:	Sample ID# C-A-13						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	24.4	-0.5	-0.8				
	2	25.7	-0.2	0.0				
	3	25.7	0.5	0.3				
	4	25.9	0.2	0.1				
	5	25.7	-0.3	-0.3				
	6	24.6	0.7	-0.2				
	7	25.4	-0.1	-0.1				
	8	25.7	0.2	-0.1				
	9	25.7	-0.1	-0.2				
	10	25.2	-0.4	-0.1				
	11	26.5	-0.4	-0.7				
	12	26.7	-0.8	-0.9				
	13	23.8	1.9	2.2				
	14	24.4	-0.1	1.3				
	15	24.3	0.1	-0.2				
	16	25.1	0.3	-0.6				
	17	25.3	-0.1	-0.2				
	18	26.2	-0.4	-1.0				
	19	26.0	-0.1	-0.3				
	20	27.0	-0.1	-0.3				
	21	25.9	1.1	0.3				
	22	26.1	0.6	0.3				
	23	25.2	-0.1	-0.3				
	24	24.8	0.1	0.4				
	25	24.3	-0.2	-0.2				
	MAX	27.0	1.9	2.2				
	MIN	23.8	-0.8	-1.0				
	AVG	25.4	0.1	-0.1				
	STD	0.8	0.6	0.7				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318314	
	Description:	Sample ID# C-A-14						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	24.5	-0.1	-0.1				
	2	24.8	0.0	-0.2				
	3	26.1	0.8	0.4				
	4	26.1	-0.4	0.3				
	5	27.3	0.8	-0.1				
	6	26.8	0.4	0.1				
	7	26.7	0.7	0.5				
	8	26.2	0.5	0.5				
	9	25.9	0.0	-0.1				
	10	25.3	-0.1	0.2				
	11	24.5	0.1	0.9				
	12	24.8	0.1	1.0				
	13	24.9	0.1	0.8				
	14	24.3	0.3	0.6				
	15	24.9	-0.2	0.4				
	16	26.1	0.9	1.1				
	17	25.7	0.6	1.2				
	18	27.5	0.2	1.6				
	19	27.1	0.3	0.8				
	20	24.7	-0.6	-1.3				
	21	24.3	-0.2	-0.6				
	22	26.0	-0.3	-0.1				
	23	25.7	0.0	-0.1				
	24	24.6	-0.4	-0.9				
	25	24.0	0.0	-0.7				
	MAX	27.5	0.9	1.6				
	MIN	24.0	-0.6	-1.3				
	AVG	25.5	0.1	0.2				
	STD	1.0	0.4	0.7				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318315	
	Description:	Sample ID# C-A-15						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	24.5	0.0	0.4				
	2	24.4	0.9	0.7				
	3	24.9	0.1	0.1				
	4	25.5	0.2	0.2				
	5	24.9	-0.1	0.0				
	6	24.8	0.3	0.5				
	7	25.8	-0.2	-0.2				
	8	25.7	-0.4	-0.4				
	9	25.2	0.1	0.2				
	10	25.7	0.2	0.0				
	11	25.1	-0.2	-0.2				
	12	24.0	0.6	0.6				
	13	23.9	0.9	0.8				
	14	24.6	0.1	0.1				
	15	24.7	0.2	0.1				
	16	25.1	0.5	0.7				
	17	25.3	0.3	0.3				
	18	25.7	0.0	0.0				
	19	25.6	0.2	0.3				
	20	26.2	0.4	0.6				
	21	25.9	-0.1	0.1				
	22	25.3	0.6	0.6				
	23	24.6	0.6	0.9				
	24	24.2	0.6	0.7				
	25	24.7	0.1	0.1				
	MAX	26.2	0.9	0.9				
	MIN	23.9	-0.4	-0.4				
	AVG	25.0	0.2	0.3				
	STD	0.6	0.3	0.3				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. C	
	Product:	Series QMSS/QFss connector				File #:	20318316	
	Description:	Sample ID# C-A-16						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	20	20	20				
	R.H. %	43	50	48				
	Date:	20May03	28May03	02Jun03				
	Pos. ID	Initial	M.Shock	Vibration				
	1	24.2	0.6	0.7				
	2	24.1	0.1	0.2				
	3	25.2	0.8	0.7				
	4	25.0	0.3	0.5				
	5	25.7	0.5	0.5				
	6	25.7	0.4	0.3				
	7	25.6	0.5	0.3				
	8	26.0	0.2	0.1				
	9	25.5	-0.3	-0.2				
	10	25.6	0.0	0.0				
	11	24.2	0.7	0.6				
	12	24.4	0.9	1.3				
	13	24.5	0.1	0.3				
	14	24.3	-0.5	-0.4				
	15	24.7	-0.5	-0.2				
	16	26.1	0.3	0.3				
	17	25.5	-0.3	0.0				
	18	26.2	0.8	0.7				
	19	25.7	0.6	1.0				
	20	24.9	0.1	0.1				
	21	25.4	-0.2	-0.1				
	22	25.6	-0.1	0.0				
	23	25.5	0.1	-0.1				
	24	24.8	-0.3	-0.5				
	25	25.0	-0.3	-0.3				
	MAX	26.2	0.9	1.3				
	MIN	24.1	-0.5	-0.5				
	AVG	25.2	0.2	0.2				
	STD	0.6	0.4	0.4				
	Open	0	0	0				
	Tech	MHB	MHB	MHB				
	Equip ID	681	681	681				
		1045	1045	1045				

TEST RESULTS

SEQUENCE D

Group A

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID# D-A-1,D-A-2, D-A-3,D-A-4,	TECHNICIAN: MHB
START DATE: 6/27/03	COMPLETE DATE: 6/27/03
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 56%
EQUIPMENT ID#: 14, 599, 553, 1028, 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, Test Condition C.

2. Test Conditions:

    a) Peak Value : 100 G
    b) Duration : 6 Milliseconds
    c) Wave Form : Half-Sine
    d) Velocity : 12.3 feet Per Second
    e) No. of Shocks : 3 Shocks/Direction, 3 Axis (18 Total)

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

REQUIREMENTS:

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

2. There shall be no contact interruption greater than 1.0 microsecond.

RESULTS:

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

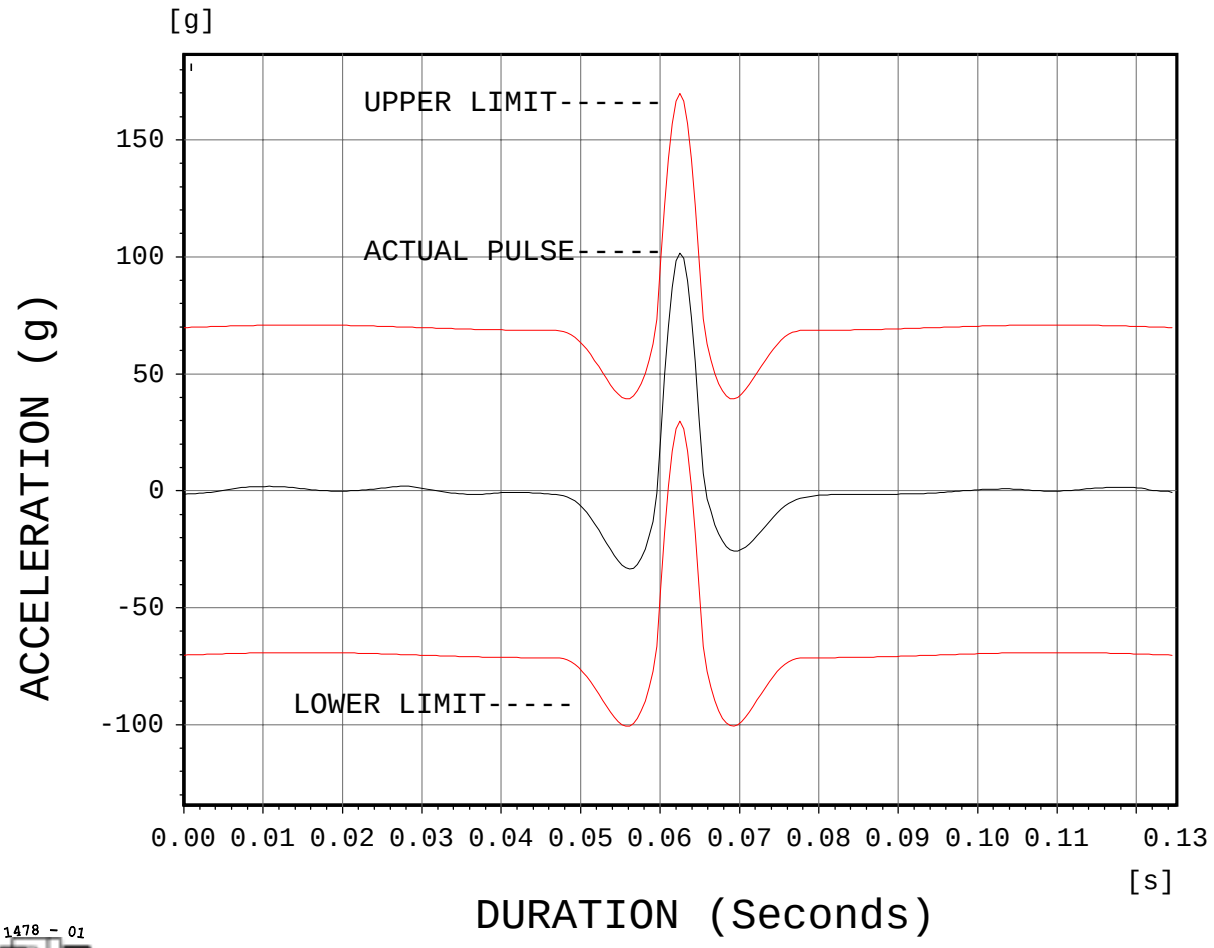
2. There was no contact interruption greater than 1.0 microsecond.

3. The Mechanical Shock characteristics are shown in Figures #7 (Calibration Pulse) and #8 (Test Pulse). Each figure displays the shock pulse contained within the upper and lower limits as defined by the appropriate test specification.

FIGURE #7

Classical Shock

Channel 1



Project 203183
Cal. Wave 1
Date: 27Jun03
Tech: /MHB
Seq. D

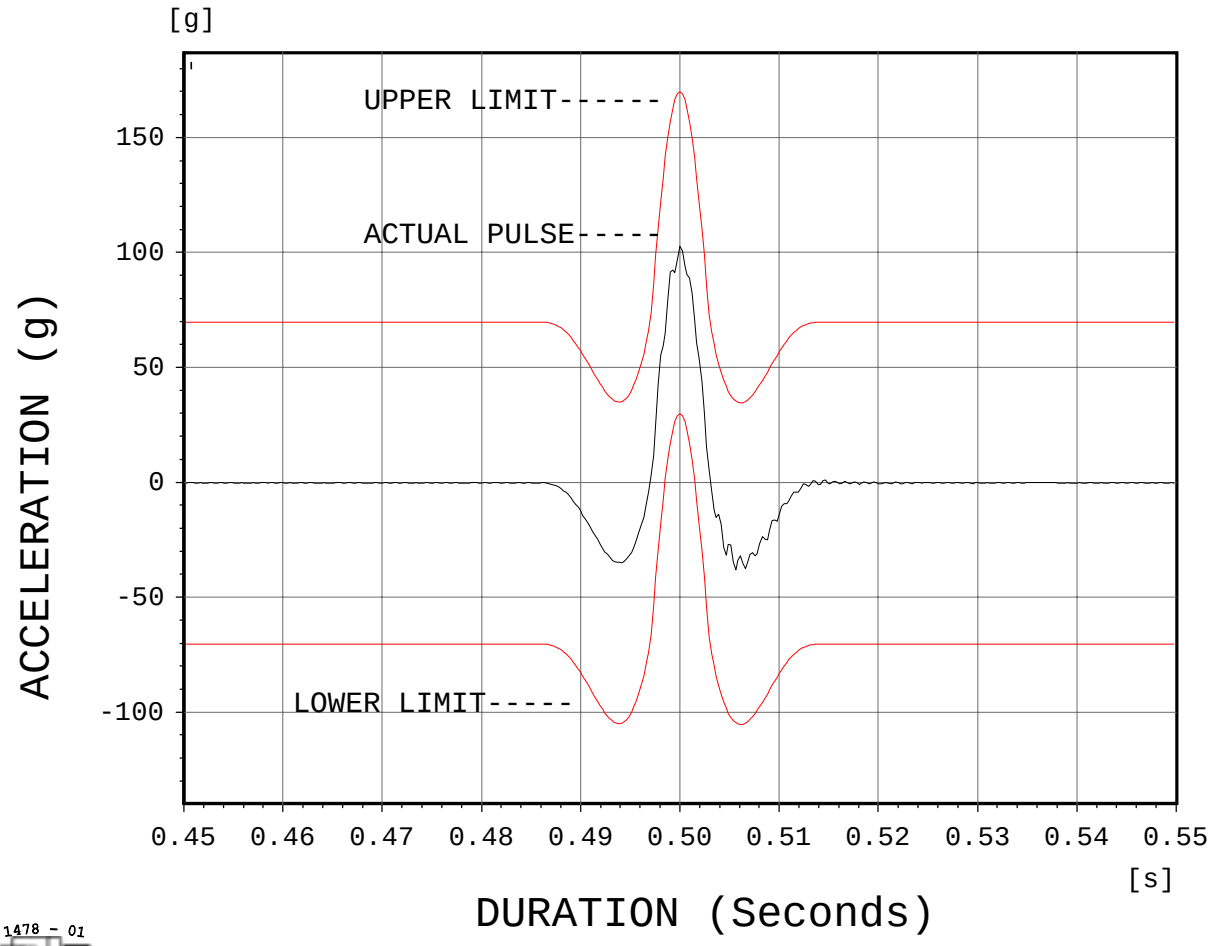
1478 - 01
ACCREDITED
1478 - 02

Contech Research

FIGURE #8

Classical Shock

Channel 1



Project 203183
Actual Wave
Date: 27Jun03
Tech: /MHB
Seq. D

1478 - 01
ACCREDITED
1478 - 02

Contech Research

PROJECT NO.: 203183 SPECIFICATION: TC0313-0166

PART NO.: QMSS-104-11-L-D-A, QFSS-104-01-L-D-A PART DESCRIPTION: QMSS/QFSS Connectors

SAMPLE SIZE:ID# D-A-1,D-A-2, D-A-3,D-A-4, TECHNICIAN: MHB

START DATE: 6/30/03 COMPLETE DATE: 7/1/03

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 64%

EQUIPMENT ID#: 14, 545, 553, 620, 1166, 1167, 1168, 1169, 1271, 1272,

VIBRATION, RANDOM

PURPOSE:

1. To determine if electrical discontinuities at the level specified exist.
2. To determine if the contact system is susceptible to fretting corrosion.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 28, Test Condition, 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. Figure #4 illustrates the test sample fixturing utilized during the test.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. There shall be no contact interruption greater than 1.0 microsecond.

RESULTS: See next page.

RESULTS:

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

2. There was no interruption greater than 1.0 microsecond.

TEST RESULTS

SEQUENCE E

Group A

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID#: 8 Samples	TECHNICIAN: MHB
START DATE: 6/23/03	COMPLETE DATE: 6/23/03
ROOM AMBIENT: 23°C	RELATIVE HUMIDITY: 60%
EQUIPMENT ID#: 681, 1047	

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:

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 #3.

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.
GROUP A			
E-A-17	23.6	24.8	21.3
E-A-18	23.8	26.0	21.9
E-A-19	22.9	24.6	20.8
E-A-20	23.3	24.7	21.5
E-A-21	23.7	25.3	21.1
E-A-22	23.8	25.2	21.4
E-A-23	23.3	25.0	21.2
E-A-24	23.6	25.7	20.6

2. See data files 20318317 through 20318324 for individual data points.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID#: 8 Samples	TECHNICIAN: MHB
START DATE: 6/26/03	COMPLETE DATE: 7/7/03
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 50%
EQUIPMENT ID#: 663, 681, 1047, 1239	

TEMPERATURE LIFE

PURPOSE:

To evaluate the impact on electrical stability of the contact system when exposed to a thermal environment. Said environment may generate temperature dependent failure mechanisms such as:

a) Reduced normal (contact) force due to stress relaxation as a result of a thermal environment.

b) Dry oxidation of base metals and/or underplates which have reached the contacting surfaces by impurity, diffusion or pore corrosion.

c) Dry oxidation and/or film formation of particulates which may have been deposited on the contacting surfaces from the surrounding atmosphere.

PROCEDURE:

1. The test samples were placed in the test chamber after it had reached equilibrium at the specified temperature level. The test exposure was performed in accordance with EIA 364, Test Procedure 17, with the following conditions:

2. Test Condition:

a) Temperature : 105°C ± 3°C
b) Duration : 250 hours
c) Mated Condition : Mated
d) Mounting Condition : Mounted

PROCEDURE:

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 damage or deterioration of the test samples so exposed.

2. The low level circuit resistance shall be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
GROUP A		
E-A-17	+0.2	+2.3
E-A-18	+0.3	+1.3
E-A-19	+0.4	+2.1
E-A-20	+0.0	+1.5
E-A-21	+0.2	+1.4
E-A-22	+0.3	+1.9
E-A-23	+0.4	+2.2
E-A-24	+0.3	+2.3

3. See data files 20318317 through 20318324 for individual data points.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID#: 8 Samples	TECHNICIAN: MHB
START DATE: 7/8/03	COMPLETE DATE: 7/8/03
ROOM AMBIENT: 23°C	RELATIVE HUMIDITY: 55%
EQUIPMENT ID#: 150, 681, 1047, 1317	

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:

	Group A
a) No. of Cycles :	50
b) Rate :	500/hr

PROCEDURE: Continued

3. The test samples were assembled to special holding devices and attached to the automatic cycling equipment utilizing constant speed control and counter systems.

4. The test samples were axially aligned to accomplish the mating and unmating function allowing for self-centering movement.

5. Care was taken to prevent the mating faces of the test samples from contacting each other.

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

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples so tested.

2. The low level circuit resistance shall be measured and recorded.

RESULTS:

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

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

CHANGE IN
LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

Sample ID#	Avg. Change	Max. Change
GROUP A		
E-A-17	+0.9	+2.0
E-A-18	+1.0	+2.0
E-A-19	+1.4	+2.3
E-A-20	+1.1	+3.1
E-A-21	+0.5	+1.4
E-A-22	+0.7	+2.4
E-A-23	+0.9	+2.5
E-A-24	+0.5	+2.8

3. See data files 20318317 through 20318324 for individual data points.

PROJECT NO.: 203183	SPECIFICATION: TC0313-0166
PART NO.: QMSS-104-11-L-D-A QFSS-104-01-L-D-A	PART DESCRIPTION: QMSS/QFSS Connectors
SAMPLE SIZE:ID#: 8 Samples	TECHNICIAN: MHB/RO
START DATE: 7/9/03	COMPLETE DATE: 7/21/03
ROOM AMBIENT: 22°C	RELATIVE HUMIDITY: 56%
EQUIPMENT ID#: 102, 208, 270, 280, 400, 436, 443, 525, 526, 543, 681, 1014, 1027, 1047, 1106, 1296, 1323, 1334	

MIXED FLOWING GAS

PURPOSE:

1. To determine the impact on electrical stability of contact interfaces when the test samples are exposed to a mixed flowing gas environment. Said environment is based on field data simulating typical, severe, non-benign environments. Said exposure is indicative of expected behavior in the field.

2. Mixed flowing gas tests (MFG) are environmental test procedures whose primary purpose is to evaluate product performance under simulated storage or operating (field) conditions. For parts involving plated contact surfaces, such tests are also used to measure the effect of plating degradation (due to the environment) on the electrical and durability properties of a contact or connector system. The specific test conditions are usually chosen so as to simulate, in the test laboratory, the effects of certain representative field environments or environmental severity levels on standard metallic surfaces.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 65 with the following conditions.

PROCEDURE: Continued

2. Environmental Conditions:

a) Temperature	:	30°C ± 1°C
b) Relative Humidity	:	70% ± 2%
c) $C1_2$	:	10 ± 3 ppb
d) NO_2	:	200 ± 50 ppb
e) H_2S	:	10 ± 5 ppb
f) SO_2	:	100 ± 20 ppb
g) Exposure Time	:	10 days
h) Mating Conditions	:	Mated
i) Mounting Conditions	:	Mounted

3. The test chamber was allowed to stabilize at the specified conditions indicated.

4. After stabilization, the test samples and control coupons were placed in the chamber such that they were no closer than 2.0" from each other and/or the chamber walls.

5. The test samples were handled in a manner so as not to disturb the contact interface.

6. After placement of the test samples in the chamber, it was allowed to re-stabilize and adjusted as required to maintain the specified concentrations and conditions.

7. The test chamber was monitored periodically during the exposure period to assure the environmental conditions as specified were maintained.

8. During the exposure, resistance measurements were taken at specific intervals and in the following sequence.

   a) Place the test samples in the test chamber.

   b) At each designated measurement period, remove the test units from the test chamber after all gases have been vented. The test samples were exposed to room ambient for one hour prior to making measurements.

   c) Measure and record low level circuit resistance measurements.

   d) Upon completion of the measurements, place the test units back into the test chamber until the next measurement interval or until completion of the test duration.

PROCEDURE: Continued

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

REQUIREMENTS:

The low level circuit resistance shall be measured and recorded.

RESULTS:

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

	CHANGE IN LOW LEVEL CIRCUIT RESISTANCE (Milliohms)			
	@5 Days		@10 Days	
Sample ID# (Mated)	Avg. Change	Max. Change	Avg. Change	Max. Change
E-A-17	+0.8	+1.5	+0.5	+1.4
E-A-18	+0.8	+2.1	+0.5	+1.8
E-A-19	+1.1	+2.1	+0.9	+2.0
E-A-20	+0.9	+3.0	+0.7	+2.7
E-A-21	+0.6	+1.4	+0.3	+1.2
E-A-22	+0.6	+3.5	+0.3	+3.3
E-A-23	+1.2	+2.4	+0.8	+2.1
E-A-24	+0.6	+2.6	+0.4	+2.4

2. See data files 20318317 through 20318324 for individual data points.

3. Five copper coupons were placed in the chamber. Upon removal said coupons were evaluated via weight gain technique with the following results:

	WEIGHT GAIN $\mu gm/cm^2/Day$	
Coupon No.	Day 1-5	Day 6-10
1	14	15
2	14+	13+
3	13	14
4	15	14
5	12+	12+

Requirement: 12 to 16 $\mu gm/cm^2/day$

LLCR DATA FILES

DATA FILE NUMBERS

20318317
20318318
20318319
20318320
20318321
20318322
20318323
20318324

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318317	
	Description:	Sample ID# E-A-17						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	23.0	0.5	0.5	0.3	0.2		
	2	23.6	0.6	1.5	1.3	1.2		
	3	23.7	1.0	1.4	1.2	1.0		
	4	24.3	0.9	0.5	0.7	0.6		
	5	22.5	2.3	1.7	1.5	1.4		
	6	21.3	1.4	-0.1	0.0	-0.1		
	7	24.0	0.2	1.0	0.9	0.5		
	8	24.8	-0.2	0.6	0.4	0.2		
	9	23.4	0.1	0.9	0.9	0.5		
	10	23.7	0.4	0.5	0.3	0.0		
	11	24.3	-0.2	1.6	0.8	0.5		
	12	22.6	0.6	1.1	1.0	0.7		
	13	22.6	0.4	1.1	1.0	0.8		
	14	24.0	-0.1	0.2	-0.1	-0.3		
	15	23.6	0.2	1.1	1.1	0.8		
	16	24.3	-0.4	0.8	1.1	0.7		
	17	24.2	-0.3	0.7	0.7	0.4		
	18	23.7	-0.1	0.9	1.1	0.8		
	19	24.1	-0.3	2.0	1.5	1.3		
	20	23.8	-0.5	0.4	0.3	0.1		
	21	24.1	0.3	1.4	1.4	1.1		
	22	24.3	-0.8	0.3	0.0	-0.2		
	23	24.5	-0.2	1.5	1.4	0.7		
	24	23.8	-0.1	0.9	0.5	0.1		
	25	23.0	-0.3	0.4	0.6	0.3		
	MAX	24.8	2.3	2.0	1.5	1.4		
	MIN	21.3	-0.8	-0.1	-0.1	-0.3		
	AVG	23.6	0.2	0.9	0.8	0.5		
	STD	0.8	0.7	0.5	0.5	0.5		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1045	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318318	
	Description:	Sample ID# E-A-18						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	22.9	0.2	1.0	0.7	0.4		
	2	23.8	-0.1	0.4	0.3	0.0		
	3	24.2	0.6	1.3	1.0	0.9		
	4	23.9	-0.4	0.2	-0.4	-0.4		
	5	24.1	-0.1	0.8	0.5	0.2		
	6	24.8	-0.2	1.3	0.4	0.1		
	7	24.6	0.0	1.3	1.5	0.8		
	8	24.2	0.1	1.9	1.8	1.8		
	9	23.5	-0.1	0.7	0.6	0.5		
	10	23.5	0.3	0.7	0.8	0.7		
	11	22.6	0.7	2.0	1.8	1.7		
	12	21.9	0.3	1.9	1.5	1.4		
	13	22.6	0.2	1.5	1.4	1.3		
	14	22.8	0.8	2.0	1.6	1.4		
	15	22.1	1.2	1.9	1.8	1.4		
	16	23.9	-0.1	1.6	1.3	1.5		
	17	24.8	-0.2	1.8	1.5	0.7		
	18	25.2	-0.3	1.3	0.9	0.1		
	19	25.4	-0.2	1.1	0.6	0.1		
	20	22.3	1.0	-0.4	-0.4	-0.5		
	21	22.4	1.3	0.5	0.5	0.5		
	22	24.5	-0.1	0.6	0.3	0.0		
	23	24.5	0.3	-0.2	-0.3	-0.6		
	24	24.6	0.8	1.9	2.1	1.1		
	25	26.0	0.8	-2.6	-2.4	-2.9		
	MAX	26.0	1.3	2.0	2.1	1.8		
	MIN	21.9	-0.4	-2.6	-2.4	-2.9		
	AVG	23.8	0.3	1.0	0.8	0.5		
	STD	1.1	0.5	1.0	1.0	1.0		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318319	
	Description:	Sample ID# E-A-19						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	20.8	2.1	2.3	1.9	1.8		
	2	22.9	0.8	1.5	1.0	0.9		
	3	23.4	1.1	1.5	1.0	0.9		
	4	24.6	0.2	-0.6	-0.6	-0.7		
	5	23.1	0.4	0.5	0.4	0.3		
	6	23.2	-0.4	-0.3	0.0	0.0		
	7	24.0	-0.4	1.1	0.8	0.7		
	8	24.4	-0.2	0.3	0.1	0.0		
	9	22.9	0.4	1.3	1.0	0.8		
	10	23.0	0.1	1.5	1.2	1.1		
	11	22.1	0.3	2.0	1.6	1.6		
	12	21.4	1.1	2.3	2.1	2.0		
	13	21.2	1.0	1.9	1.8	1.8		
	14	21.4	1.3	2.0	1.5	1.3		
	15	21.7	0.3	1.2	0.9	0.7		
	16	23.0	0.7	1.5	1.3	1.2		
	17	23.6	0.3	1.8	1.5	1.4		
	18	23.6	-0.2	1.7	1.4	1.3		
	19	23.4	0.2	1.2	0.9	0.7		
	20	23.9	0.2	2.0	1.8	1.6		
	21	23.9	-0.5	1.6	1.2	0.9		
	22	23.8	-0.5	0.6	0.4	0.2		
	23	23.3	0.0	1.5	0.9	0.5		
	24	21.6	0.5	1.5	1.5	1.3		
	25	21.2	0.8	1.9	1.7	1.4		
	MAX	24.6	2.1	2.3	2.1	2.0		
	MIN	20.8	-0.5	-0.6	-0.6	-0.7		
	AVG	22.9	0.4	1.4	1.1	0.9		
	STD	1.1	0.6	0.7	0.6	0.7		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318320	
	Description:	Sample ID# E-A-20						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	21.8	-0.6	0.7	0.7	0.4		
	2	21.5	0.8	1.8	1.7	1.6		
	3	23.1	0.2	1.1	1.0	1.0		
	4	22.6	0.2	0.8	0.6	0.5		
	5	24.4	-0.1	1.6	1.5	1.3		
	6	24.2	0.0	1.5	1.3	1.1		
	7	24.1	0.0	1.1	1.0	0.8		
	8	23.5	0.7	1.7	1.3	1.0		
	9	22.0	1.5	3.1	2.9	2.7		
	10	22.8	0.5	1.8	1.5	1.1		
	11	21.7	0.9	2.2	1.9	1.7		
	12	21.9	0.4	0.8	1.0	0.8		
	13	22.1	-0.6	1.0	0.9	0.7		
	14	22.0	-0.3	1.6	3.0	1.3		
	15	21.9	-0.1	0.9	2.9	0.7		
	16	24.1	-0.6	1.1	0.6	0.8		
	17	24.1	-0.6	0.8	0.9	0.6		
	18	24.2	-0.4	0.8	-0.4	0.2		
	19	24.4	-0.5	1.4	-0.1	0.5		
	20	24.7	0.2	-0.8	-0.8	-1.0		
	21	24.2	0.3	0.5	0.1	0.1		
	22	24.5	-0.1	0.5	0.6	0.5		
	23	24.6	-0.2	-0.1	-0.2	-0.4		
	24	23.9	-0.7	0.5	-0.6	-0.6		
	25	23.2	-0.1	0.3	0.0	-0.2		
	MAX	24.7	1.5	3.1	3.0	2.7		
	MIN	21.5	-0.7	-0.8	-0.8	-1.0		
	AVG	23.3	0.0	1.1	0.9	0.7		
	STD	1.1	0.6	0.8	1.0	0.8		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318321	
	Description:	Sample ID# E-A-21						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	23.6	0.1	0.0	0.1	-0.2		
	2	23.3	0.0	0.9	0.8	0.3		
	3	23.6	0.2	0.6	0.5	0.2		
	4	23.9	0.5	0.0	-0.3	-0.3		
	5	22.0	1.4	0.8	1.3	1.2		
	6	21.1	1.3	1.3	1.2	1.0		
	7	25.3	-0.3	0.0	0.1	0.1		
	8	24.4	0.4	-0.1	0.3	0.4		
	9	25.0	-0.3	0.5	1.0	1.0		
	10	24.1	0.3	0.4	0.6	0.3		
	11	23.1	1.3	1.4	0.9	0.8		
	12	23.0	0.9	1.2	0.6	0.2		
	13	22.1	1.2	1.4	1.2	1.1		
	14	23.6	0.6	-0.4	-0.3	-0.4		
	15	23.1	0.2	1.2	1.4	0.9		
	16	24.7	-0.6	1.0	0.7	0.2		
	17	24.7	-0.5	0.2	0.0	-0.3		
	18	24.5	-0.6	0.4	0.8	0.9		
	19	24.7	-0.8	-0.1	0.2	-0.4		
	20	24.5	-0.7	0.2	0.5	0.0		
	21	24.8	-0.1	0.4	0.5	0.2		
	22	24.0	0.3	0.7	0.6	-0.2		
	23	24.0	0.7	0.4	0.7	0.5		
	24	22.4	0.5	0.4	0.6	0.4		
	25	23.8	0.1	-0.2	-0.1	-0.5		
	MAX	25.3	1.4	1.4	1.4	1.2		
	MIN	21.1	-0.8	-0.4	-0.3	-0.5		
	AVG	23.7	0.2	0.5	0.6	0.3		
	STD	1.0	0.6	0.5	0.5	0.5		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318322	
	Description:	Sample ID# E-A-22						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	23.4	-0.4	0.5	0.4	0.0		
	2	23.1	0.4	0.4	0.3	0.1		
	3	24.1	0.7	0.2	0.4	0.1		
	4	24.3	0.5	0.1	0.5	0.3		
	5	24.2	-0.2	0.7	0.5	0.0		
	6	25.2	-0.3	0.5	0.2	-0.3		
	7	24.9	-1.0	0.0	-0.3	-0.8		
	8	24.0	-0.3	0.6	0.0	-0.4		
	9	24.6	-0.2	1.0	0.9	0.6		
	10	23.5	0.9	0.2	1.2	1.4		
	11	22.8	0.4	1.0	0.8	0.4		
	12	23.7	0.2	0.3	0.3	-0.2		
	13	23.1	0.5	0.0	-0.1	-0.4		
	14	23.2	0.5	-0.1	0.1	0.2		
	15	23.9	0.1	0.5	0.6	0.3		
	16	24.2	-0.1	0.6	0.4	-0.2		
	17	24.6	-0.2	1.0	1.0	0.9		
	18	24.5	-0.1	-0.2	-0.1	-0.4		
	19	24.4	0.4	0.8	0.2	-0.1		
	20	21.4	1.4	2.2	2.4	1.3		
	21	21.7	1.9	2.4	3.5	3.3		
	22	24.6	1.4	1.7	1.7	1.7		
	23	24.3	0.8	0.7	0.1	-0.4		
	24	23.5	0.4	0.8	1.1	0.7		
	25	24.6	0.2	0.2	0.2	0.0		
	MAX	25.2	1.9	2.4	3.5	3.3		
	MIN	21.4	-1.0	-0.2	-0.3	-0.8		
	AVG	23.8	0.3	0.7	0.6	0.3		
	STD	0.9	0.6	0.6	0.8	0.9		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318323	
	Description:	Sample ID# E-A-23						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	21.8	0.4	0.4	0.4	0.3		
	2	22.4	1.3	1.1	1.2	1.0		
	3	24.1	0.9	1.1	1.5	-0.8		
	4	23.3	2.2	1.1	1.6	1.4		
	5	22.9	1.0	1.2	0.7	0.3		
	6	21.2	1.9	1.2	1.4	0.8		
	7	24.6	-0.5	1.0	1.2	0.8		
	8	24.1	-0.2	1.4	1.6	1.0		
	9	22.8	-0.1	1.6	1.5	1.1		
	10	23.6	-0.5	0.1	0.5	0.2		
	11	22.9	-0.5	0.6	1.0	0.7		
	12	22.0	0.7	2.1	2.0	2.1		
	13	22.1	0.7	1.8	2.0	1.7		
	14	23.5	0.6	-0.1	0.7	0.5		
	15	23.2	0.6	0.9	2.1	1.7		
	16	23.9	0.3	0.6	1.0	0.6		
	17	24.1	-0.1	0.8	0.7	0.3		
	18	24.2	0.2	0.3	1.6	1.1		
	19	25.0	0.2	0.0	0.8	-0.3		
	20	23.8	0.7	1.4	1.6	1.3		
	21	24.9	0.5	1.2	1.4	0.5		
	22	24.3	0.0	0.1	0.7	0.4		
	23	23.8	0.2	0.3	0.4	0.0		
	24	23.2	0.0	0.3	0.9	0.5		
	25	21.8	0.7	2.5	2.4	2.0		
	MAX	25.0	2.2	2.5	2.4	2.1		
	MIN	21.2	-0.5	-0.1	0.4	-0.8		
	AVG	23.3	0.4	0.9	1.2	0.8		
	STD	1.0	0.7	0.7	0.6	0.7		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		

			Low Level Contact Resistance					
	Project:	203183				Spec:	EIA 364, TP23	
	Customer:	Samtec				Subgroup:	Seq. E	
	Product:	Series QMSS/QFss connector				File #:	20318324	
	Description:	Sample ID# E-A-24						
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp ºC	23	22	23	23	22		
	R.H. %	60	50	55	52	56		
	Date:	23Jun03	07Jul03	08Jul03	14Jul03	21Jul03		
	Pos. ID	Initial	T.Aging	Dura	5 Days	10 Days		
	1	22.5	0.8	1.4	1.5	1.3		
	2	22.8	0.8	0.9	1.0	0.8		
	3	24.4	0.3	0.3	0.5	0.3		
	4	24.1	-0.1	-0.3	0.0	-0.1		
	5	24.4	0.3	0.4	0.5	0.1		
	6	24.9	-0.1	-0.3	-0.1	0.2		
	7	25.5	-1.0	-0.3	-0.3	-1.0		
	8	23.8	0.3	0.4	0.9	1.0		
	9	24.6	-0.7	-0.3	0.4	-0.9		
	10	23.7	-0.1	0.0	0.4	-0.1		
	11	23.5	0.0	0.3	0.4	-0.2		
	12	23.2	-0.3	0.1	0.2	0.5		
	13	24.3	-0.9	-1.0	-0.9	-1.1		
	14	24.2	-0.4	-0.4	-0.3	-0.5		
	15	23.4	-0.1	0.5	0.5	0.2		
	16	25.7	-0.7	-0.2	-0.2	-0.5		
	17	24.7	-0.1	-0.1	-0.2	-0.4		
	18	25.1	0.0	0.4	0.2	-0.1		
	19	24.6	0.3	-0.3	-0.5	-0.6		
	20	21.0	1.3	2.0	2.0	1.9		
	21	21.2	2.3	1.6	1.7	1.8		
	22	23.6	0.5	0.9	1.1	1.0		
	23	23.5	1.0	1.4	1.2	1.0		
	24	21.1	2.1	2.4	2.1	2.1		
	25	20.6	1.8	2.8	2.6	2.4		
	MAX	25.7	2.3	2.8	2.6	2.4		
	MIN	20.6	-1.0	-1.0	-0.9	-1.1		
	AVG	23.6	0.3	0.5	0.6	0.4		
	STD	1.4	0.9	1.0	0.9	1.0		
	Open	0	0	0	0	0		
	Tech	MHB	MHB	MHB	MHB	MHB		
	Equip ID	681	681	681	681	681		
		1047	1047	1047	1047	1047		