

JANUARY 13, 2003

TEST REPORT #202730

IPBD CONNECTOR TESTING

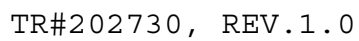
PART NUMBER

IPBD-115-01-T-D-12-18

SAMTEC, INC.



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

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CERTIFICATION

This is to certify that the IPBD 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
Vice President And
Director Of Test Program Development
Contech Research, Inc.

TP:js



SCOPE

To perform qualification testing on the IPBD connector as manufactured and submitted by the test sponsor Samtec, Inc.

APPLICABLE DOCUMENTS

1. Samtec Specifications: TC0242-0765Flowchart
2. 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) IPBD Connectors IPBD-115-01-T-D-12-18

2. The Sequence C test samples were supplied assembled and terminated to test boards by the test sponsor. All other samples were supplied unmounted.
3. Connectors were supplied with the appropriate conductors crimped in place by the test sponsor.
4. Applicable qualified mating connectors were supplied by the test sponsor.
5. Figure #1 illustrates the configuration of a typical test sample/test board assembly.
6. The test samples were tested in their 'as received' condition.
7. 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.
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
 : Group B1 - A-B1-1,A-B1-2*
 : Group B2 - A-B2-1,A-B2-2*
 : Group B3 - A-B3-1,A-B3-2*

* Sample ID#'s A-B1-2, A-B1-2 and A-B3-2 were used to determine the dielectric breakdown voltage.

Sequence B : Group A - B-A1-1,B-A1-2,B-A1-3,B-A1-4,
 B-A1-5,B-A1-6,B-A1-7,B-A1-8

Sequence C : Group A - C-A-1,C-A-2

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

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



FIGURE #1

TYPICAL TEST SAMPLE/TEST BOARD

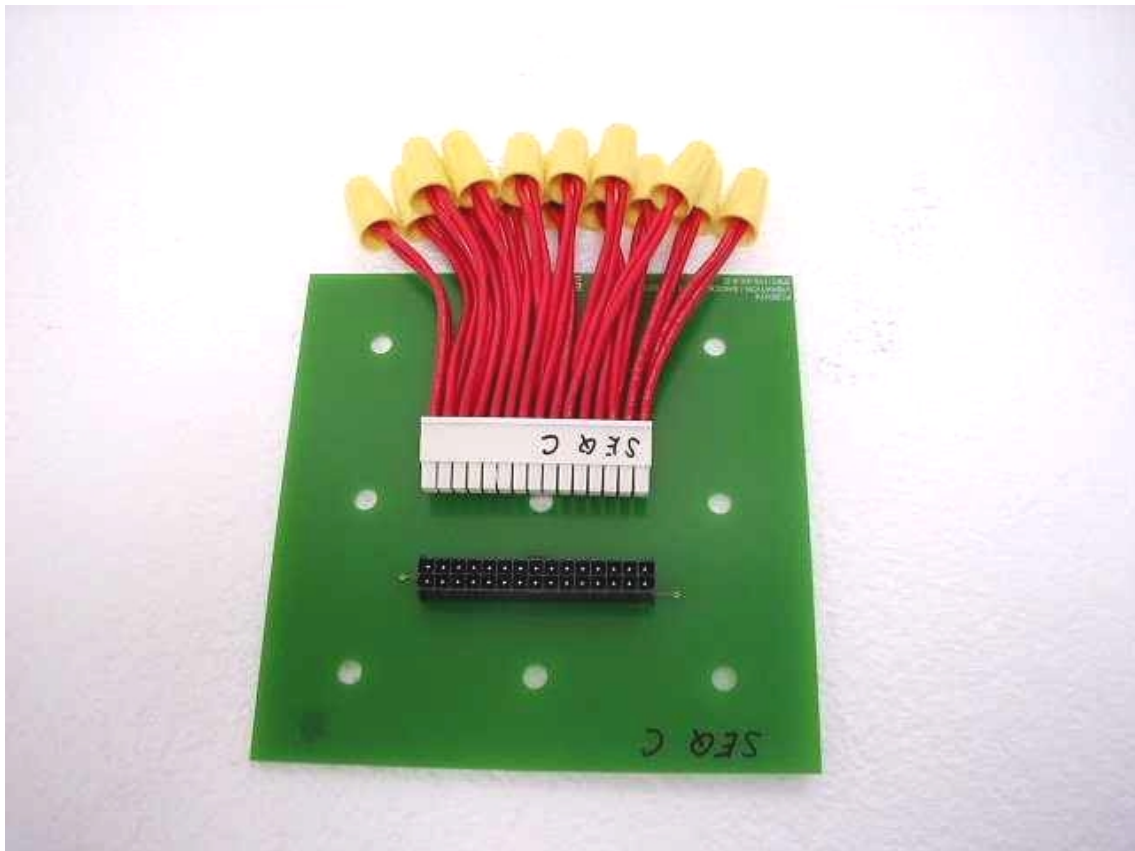
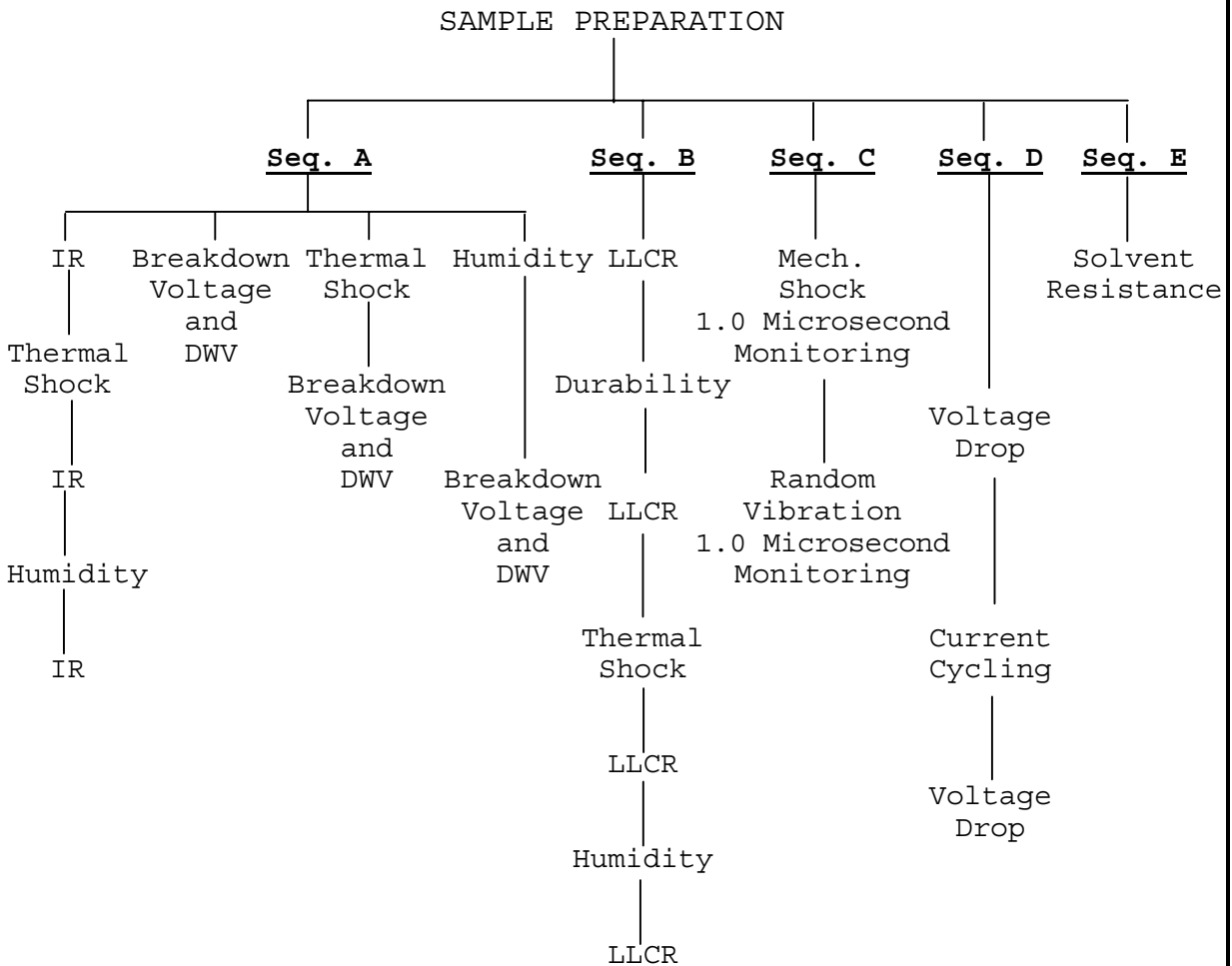


FIGURE #2

TEST PLAN FLOW DIAGRAM



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

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



DATA SUMMARY

TEST

REQUIREMENT

RESULTS

SEQUENCE A

Group A

Insulation Resistance	1000 Megohms Min.	>50000 Megohms
Thermal Shock	No Damage	Passed
Insulation Resistance	1000 Megohms Min.	>50000 Megohms
Humidity	No Damage	Passed
Insulation Resistance	1000 Megohms Min.	>50000 Megohms

Group B1

Breakdown Voltage	Record Voltage	3900 VAC
DWV @ 75% of Breakdown Voltage	2925 VAC	Passed

Group B2

Thermal Shock	No Damage	Passed
Breakdown Voltage	Record Voltage	3400 VAC
DWV @ 75% of Breakdown Voltage	2550 VAC	Passed

Group B3

Humidity	No Damage	Passed
Breakdown Voltage	Record Voltage	3500 VAC
DWV @ 75% of Breakdown Voltage	2625 VAC	Passed

SEQUENCE B

Group A

LLCR	Record	4.5 m Ω Max.
Durability	No Damage	Passed
LLCR	+10.0 m Ω Max.Chg.	+0.7 m Ω Max.Chg.
Thermal Shock	No Damage	Passed
LLCR	+10.0 m Ω Max.Chg.	+2.0 m Ω Max.Chg.
Humidity	No Damage	Passed
LLCR	+10.0 m Ω Max.Chg.	+4.7 m Ω Max.Chg.



DATA SUMMARY - Continued:

<u>TEST</u>	<u>REQUIREMENT</u>	<u>RESULTS</u>
<u>SEQUENCE C</u>		
<u>Group A</u>		
Mechanical Shock	No Damage	Passed
	1.0 Microsecond	Passed
Random Vibration	No Damage	Passed
	1.0 Microsecond	Passed
<u>SEQUENCE D</u>		
<u>Group A</u>		
Voltage Drop	Record	70.2 mV Max.
Current Cycle	No Damage	Passed
Voltage Drop		
@ 250 Hours	Record	72.2 mV Max.
@ 500 Hours	Record	73.5 mV Max.
<u>SEQUENCE E</u>		
<u>Group A</u>		
Solvent Resistance	No Damage	Passed



EQUIPMENT LIST

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
1	6/11/03	6/11/02	Digital Thermometer	John Fluke Mfg.	2190A	2775012	See cal cert	12mon.
11	12/26/02	12/26/01	Force Gage - 25 lbs	Chatillon	DPP-25	20723	±.25LBS	12 mon.
25	8/7/03	8/7/02	DC Power Supply 10Amps	Hewlett Packard	6002A	2113A-05285	See Cal Cert	12 mon.
27			Temp. Humid. Chamber	Blue M Co.	FR-256PC-1	F2-249	See Cal Cert	Each Test
55			Air Fume Hood	Labconco	47715	61279	N/A	N/A
171			Temperature Control	Dowty	MDC5	1169	N/A	Each Test
192			Vertical Thermal Shock	Cincinnati Sub-Zero	VTS-1-5-3	88-11094	See Cal Cert	Each Test
236	7/31/03	7/31/02	Micro-Ohm Meter	Keithley Instr.	580	462173	See Cal Cert	12 mon
297	10/8/03	10/8/02	Micro-Ohm Meter	Keithley Instr.	580	485414	See Cal Cert	12mon
321	1/25/03	1/25/02	AC-DC Hipot/Megometer	Hipotronics Co.	H300B	DS16-201	See Cal Cert	12 mon.
323			Computer	Legatech	286-12	N/A	N/A	N/A
419	11/18/03	11/18/02	Digital Multimeter	Hewlett Packard	34401A	3146A04392	See Cal Cert	12mon
465	6/21/03	6/21/02	Precision Resistor	Victoreen Co.	5000 Megohm	N/A	± 1 %	12 mon.
466	6/21/03	6/21/02	Precision Resistor	Victoreen Co.	50,000 mego	N/A	± 1 %	12 mon.
553	12/6/03	12/6/02	12 channel Power Unit	PCB Co.	483A	1303	See Cal Cert	12mon
584	8/15/03	8/15/02	Digital Multimeter	Hewlett Packard Co.	3478A	2911AS4039	See Cal.Cert.	12 mon.
594			Computer	Sensible P/C	586-133	DX-133	N/A	N/A
609			Ultrasonic Cleaner	Branson	5210	9609010C	N/A	N/A
629	9/17/03	9/17/02	Digital Thermometer	Omega Eng.	DP 116	6232189	±1.1DegC	12mon
632			Bench Oven	Blue M. Co.	ESP 400C-5	ESP 282	N/A	Each Test
650	8/15/03	8/15/02	Digital Multimeter	Hewlett Packard	34401A	US36032126	See Cal Cert	12 mon.
667	10/24/03	10/24/02	Current Shunt	Simpson	200-50	01	±1 %	12mon
684	6/14/03	6/14/02	Accelerometer	PCB. Co.	353B04	47648	See Cal Cert.	12mon
689	4/18/03	4/18/02	DC Power Supply 30Amps	Hewlett Packard	6033A	2548A01848	See Cal.Cert.	12 mon.
1166	3/7/03	3/7/02	Sine/Rndm Vib Control Digitizer	Hewlett Packard	E1432A	US39342279	See Cal Cert	12mon



EQUIPMENT LIST- Continued

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
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
1175	12/11/03	12/11/02	Discontinuity Monitor	Metronics	DM3000-10	6-2K-1	See Cal Cert	12mon
1271			Amplifier	Unholtz Dickie	SA15	3483	See Manual	N/A
1272			Shaker Table	Unholtz Dickie	S202PB	263	N/A	N/A
1339	1/2/03	1/2/02	Hipot Tester A/C-DC	Quad Tech	Sentry 30	2052040	See Cert	12mon
1366			Main Frame	Aiglent H.P.	8408A		N/A	N/A



TEST RESULTS

SEQUENCE A

Group A



PROJECT NO.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# A-A-1,A-A-2 TECHNICIAN: SR

START DATE: 12/3/02 COMPLETE DATE: 12/3/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 32%

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.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# A-A-1,A-A-2 TECHNICIAN: SR

START DATE: 12/3/02 COMPLETE DATE: 12/13/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 38%

EQUIPMENT ID#: 321, 465, 466, 629, 632

THERMAL AGING

PURPOSE:

To evaluate the impact on electrical stability of the contact system when exposed to a thermal environment

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 ± 2°C
 - b) Duration : 250 hours
 - c) Mated Condition : Mated
 - d) Mounting Condition: Unmounted
 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 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 50,000 megohms.



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# A-A-1,A-A-2 TECHNICIAN: SR

START DATE: 12/27/02 COMPLETE DATE: 1/6/03

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 36%

EQUIPMENT ID#: 27, 321, 465, 466

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 : Unmounted
 - 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 50000 megohms after air dry of 2 hours.



TEST RESULTS

SEQUENCE A

Group B1



PROJECT NO.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# A-B1-1,A-B1-2 TECHNICIAN: SR

START DATE: 12/4/02 COMPLETE DATE: 12/4/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 30%

EQUIPMENT ID#: 321, 1339

DIELECTRIC WITHSTANDING VOLTAGE (SEA LEVEL)

PURPOSE:

To determine the voltage at which dielectric breakdown occurs and if the separate samples maintain their dielectric integrity when tested at 75% of the breakdown voltage.

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-B1-2 was used to determine the breakdown voltage. Sample ID# A-B1-1 was subsequently tested at 75% of the breakdown voltage.

REQUIREMENTS: See next page.



REQUIREMENTS:

1. The voltage at which dielectric breakdown occurs shall be measured and recorded.
2. When 75% of 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 was 3900 VAC.
2. No dielectric breakdown occurred on separate test samples when tested at 75% of the breakdown voltage (2925 VAC).



TEST RESULTS

SEQUENCE A

Group B2



PROJECT NO.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# A-B2-1,A-B2-2 TECHNICIAN: SR

START DATE: 12/3/02 COMPLETE DATE: 12/13/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 38%

EQUIPMENT ID#: 321, 629, 632

THERMAL AGING

PURPOSE:

To evaluate the impact on electrical stability of the contact system when exposed to a thermal environment.

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 ± 2°C
 - b) Duration : 250 Hours
 - c) Mated Condition : Mated
 - d) Mounting Condition: Unmounted
3. 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.
4. Sample ID# A-B2-2 was used to determine the breakdown voltage. Sample ID# A-B2-1 was subsequently tested at 75% of the breakdown voltage.

REQUIREMENTS: See next page.



REQUIREMENTS:

1. There shall be no evidence of physical damage or deterioration of the test samples so exposed.
2. The dielectric breakdown voltage shall be measured and recorded.
3. There shall be no evidence of breakdown, arcing, etc., when 75% of the breakdown voltage is applied to separate samples.

RESULTS:

1. There was no evidence of visual or physical damage to the test samples as tested.
2. The voltage at which dielectric breakdown occurred was 3400 VAC.
3. No dielectric breakdown occurred when tested at 75% of the breakdown voltage (2550 VAC).



TEST RESULTS

SEQUENCE A

Group B3



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18

PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# A-B3-1,A-B3-2

TECHNICIAN: SR

START DATE: 12/3/02

COMPLETE DATE: 12/13/02

ROOM AMBIENT: 20°C

RELATIVE HUMIDITY: 32%

EQUIPMENT ID#: 27, 321

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 : Unmounted
- 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. The voltage was applied to specific test points on the board.
5. Sample ID# A-B3-2 was used to determine the breakdown voltage. Sample ID# A-B3-1 was subsequently tested at 75% of the breakdown voltage.

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. There was no evidence of arcing, breakdown, etc., when 75% of the breakdown voltage is applied to separate samples.

RESULTS:

- 1. The test samples as tested showed no evidence of physical deterioration.
- 2. The voltage at which dielectric breakdown occurred was 3500 VAC.
- 3. No dielectric breakdown occurred on separate test samples when tested at 75% of the breakdown voltage (2625 VAC).



TEST RESULTS

SEQUENCE B

Group A



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18

PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# B-A1-1, B-A1-2, TECHNICIAN: SR
B-A1-3, B-A1-4, B-A1-5,
B-A1-6, B-A1-7, B-A1-8

START DATE: 12/5/02

COMPLETE DATE: 12/5/02

ROOM AMBIENT: 20°C

RELATIVE HUMIDITY: 30%

EQUIPMENT ID#: 236, 594

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)

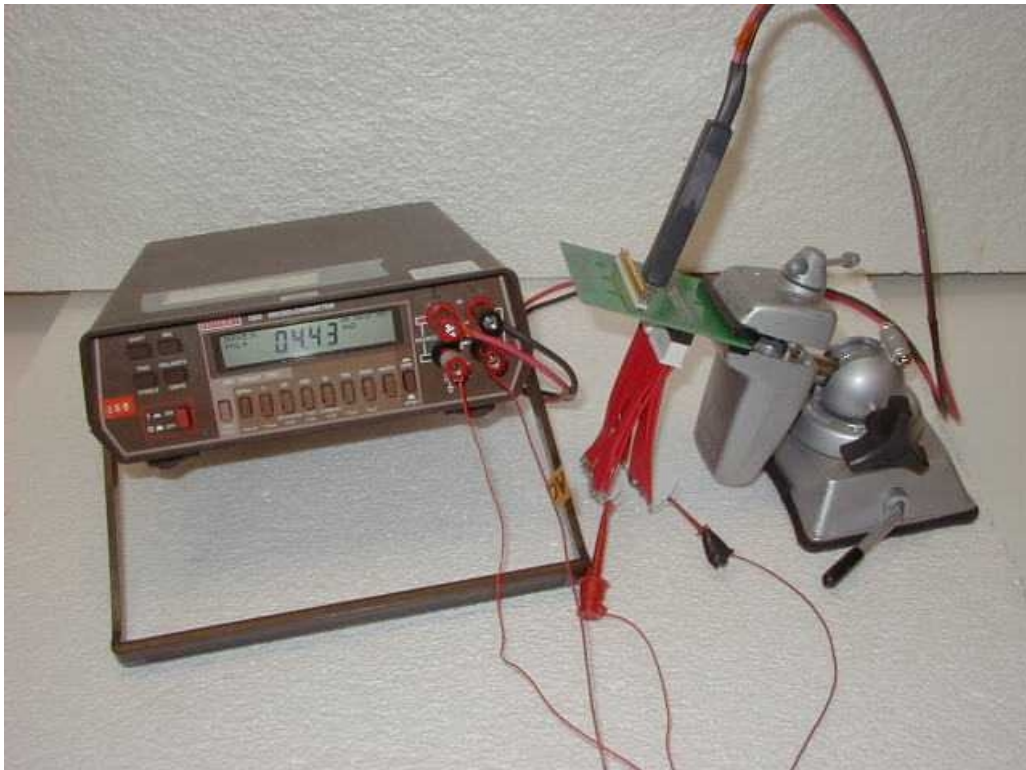
<u>Sample ID#</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
B-A1-1	3.6	3.9	3.4
B-A1-2	3.6	3.9	3.4
B-A1-3	3.7	4.5	3.5
B-A1-4	3.7	4.0	3.5
B-A1-5	3.7	4.3	3.6
B-A1-6	3.6	3.9	3.5
B-A1-7	3.6	3.9	3.4
B-A1-8	3.7	4.2	3.4

2. See data files 20273001 through 20273008 for individual data points.



FIGURE #3

TYPICAL LLCR SET UP



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18

PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# B-A1-1, B-A1-2, TECHNICIAN: SR
B-A1-3, B-A1-4, B-A1-5,
B-A1-6, B-A1-7, B-A1-8

START DATE: 12/6/02

COMPLETE DATE: 12/6/02

ROOM AMBIENT: 20°C

RELATIVE HUMIDITY: 32%

EQUIPMENT ID#: 236, 594

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 of 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 : 30
 - 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. 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:

<u>Sample ID#</u>	CHANGE IN LOW LEVEL CIRCUIT RESISTANCE (Milliohms)	
	Avg.	Max.
	<u>Change</u>	<u>Change</u>
B-A1-1	-0.1	+0.1
B-A1-2	+0.1	+0.4
B-A1-3	+0.0	+0.7
B-A1-4	+0.0	+0.1
B-A1-5	+0.0	+0.1
B-A1-6	+0.0	+0.1
B-A1-7	+0.0	+0.4
B-A1-8	+0.0	+0.4

3. See data files 20273001 through 20273008 for individual data points.



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18

PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# B-A1-1, B-A1-2, TECHNICIAN: SR
B-A1-3, B-A1-4, B-A1-5,
B-A1-6, B-A1-7, B-A1-8

START DATE: 12/5/02

COMPLETE DATE: 12/16/02

ROOM AMBIENT: 21°C

RELATIVE HUMIDITY: 37%

EQUIPMENT ID#: 11, 192, 236, 594

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 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:

<u>Sample ID#</u>	CHANGE IN LOW LEVEL CIRCUIT RESISTANCE (Milliohms)	
	Avg.	Max.
	<u>Change</u>	<u>Change</u>
B-A1-1	+0.5	+1.4
B-A1-2	+0.3	+0.9
B-A1-3	+0.3	+2.0
B-A1-4	+0.2	+0.7
B-A1-5	+0.4	+1.1
B-A1-6	+0.3	+0.9
B-A1-7	+0.3	+1.0
B-A1-8	+0.2	+0.9

3. See data files 20273001 through 20273008 for individual data points.



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18

PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# B-A1-1, B-A1-2, B-A1-3, B-A1-4, B-A1-5,
B-A1-6, B-A1-7, B-A1-8

TECHNICIAN: SR/DAM

START DATE: 12/17/02

COMPLETE DATE: 12/27/02

ROOM AMBIENT: 20°C

RELATIVE HUMIDITY: 34%

EQUIPMENT ID#: 27, 297, 323

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, Procedure III 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



PROCEDURE: Continued

- f) Mating Conditions : Mated
- g) Mounting Conditions : Mounted
- h) Duration : 240 hours

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

REQUIREMENTS:

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

RESULTS:

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

<u>Sample ID#</u>	CHANGE IN LOW LEVEL CIRCUIT RESISTANCE (Milliohms)	
	<u>Avg. Change</u>	<u>Max. Change</u>
B-A1-1	+0.8	+2.2
B-A1-2	+0.7	+1.5
B-A1-3	+0.4	+3.4
B-A1-4	+0.7	+2.0
B-A1-5	+0.5	+3.6
B-A1-6	+0.6	+1.6
B-A1-7	+1.2	+4.7
B-A1-8	+0.9	+2.9

3. See data files 20273001 through 20273008 for individual data points.



LLCR DATA FILES

DATA FILE NUMBERS

20273001

20273002

20273003

20273004

20273005

20273006

20273007

20273008



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B /Gp A		
	Product: Series IPBD Connector					File #: 20273001		
	Description: Sample ID# B-A1-1							
	Open circuit voltage: 20mv					Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	32	37	34			
	Date:	05Dec02	06Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.6	-0.1	0.3	0.9			
	2	3.6	-0.1	0.4	0.7			
	3	3.6	-0.2	0.2	0.7			
	4	3.6	-0.2	0.4	0.3			
	5	3.6	-0.2	0.0	0.1			
	6	3.5	-0.2	0.3	0.1			
	7	3.5	0.0	0.1	0.2			
	8	3.6	0.1	0.5	1.1			
	9	3.6	-0.2	0.5	1.2			
	10	3.5	0.1	0.4	0.4			
	11	3.7	0.0	0.3	0.8			
	12	3.5	0.1	0.3	0.3			
	13	3.7	-0.1	0.2	0.2			
	14	3.6	0.0	0.6	0.3			
	15	3.6	0.0	0.6	0.6			
	16	3.6	0.0	0.4	0.3			
	17	3.6	-0.1	1.4	1.7			
	18	3.6	-0.2	0.6	2.2			
	19	3.9	-0.2	-0.2	-0.1			
	20	3.8	-0.1	0.6	1.5			
	21	3.6	0.0	1.0	2.2			
	22	3.7	-0.1	0.3	0.5			
	23	3.6	-0.3	0.3	0.3			
	24	3.4	0.1	1.3	1.5			
	25	3.7	-0.1	0.8	1.2			
	MAX	3.9	0.1	1.4	2.2			
	MIN	3.4	-0.3	-0.2	-0.1			
	AVG	3.6	-0.1	0.5	0.8			
	STD	0.1	0.1	0.4	0.7			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B /Gp A		
	Product: Series IPBD Connector					File #: 20273002		
	Description: Sample ID# B-A1-2							
	Open circuit voltage: 20mv					Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	32	37	34			
	Date:	05Dec02	06Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.4	0.2	0.4	0.5			
	2	3.6	0.0	0.3	0.7			
	3	3.5	0.2	0.3	0.9			
	4	3.5	0.1	0.2	0.4			
	5	3.5	0.2	0.3	0.6			
	6	3.7	0.1	0.4	1.0			
	7	3.6	0.0	0.3	0.5			
	8	3.9	0.0	0.4	1.2			
	9	3.8	0.1	0.3	1.2			
	10	3.5	0.4	0.6	1.4			
	11	3.5	0.3	0.5	1.3			
	12	3.7	0.0	0.2	1.2			
	13	3.6	0.0	0.1	0.2			
	14	3.7	-0.1	0.1	0.0			
	15	3.6	0.1	0.2	0.4			
	16	3.9	-0.1	0.1	0.7			
	17	3.7	0.0	0.3	0.7			
	18	3.6	0.1	0.9	1.5			
	19	3.5	0.2	0.3	0.4			
	20	3.6	0.1	0.1	0.2			
	21	3.6	0.1	0.2	0.2			
	22	3.6	0.1	0.2	0.2			
	23	3.5	0.2	0.3	0.5			
	24	3.5	0.0	0.5	0.9			
	25	3.6	-0.1	0.3	0.7			
	MAX	3.9	0.4	0.9	1.5			
	MIN	3.4	-0.1	0.1	0.0			
	AVG	3.6	0.1	0.3	0.7			
	STD	0.1	0.1	0.2	0.4			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B / Gp A		
	Product: Series IPBD Connector					File #: 20273003		
	Description: Sample ID# B-A1-3							
	Open circuit voltage: 20mv					Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	32	37	34			
	Date:	05Dec02	06Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.6	-0.2	0.7	0.2			
	2	3.6	0.0	0.6	0.4			
	3	3.6	0.0	0.2	0.1			
	4	3.7	-0.1	0.2	0.1			
	5	3.7	0.0	0.2	0.2			
	6	3.7	-0.2	0.2	0.2			
	7	3.5	0.2	0.5	0.4			
	8	3.7	-0.1	0.3	0.4			
	9	3.5	-0.1	0.7	0.2			
	10	3.7	0.0	0.3	0.5			
	11	3.7	0.0	0.5	0.4			
	12	3.6	0.0	0.1	0.4			
	13	3.6	0.0	0.3	0.1			
	14	3.7	-0.1	0.0	0.3			
	15	3.6	0.0	2.0	-0.1			
	16	4.5	0.7	-0.8	3.4			
	17	3.6	0.0	0.2	0.4			
	18	3.7	0.1	0.0	0.5			
	19	3.7	0.0	0.0	0.0			
	20	3.7	0.0	0.1	0.2			
	21	3.8	0.0	-0.2	0.3			
	22	3.5	0.0	0.2	0.1			
	23	3.6	0.0	0.1	0.5			
	24	3.7	0.0	0.0	0.3			
	25	3.6	0.0	0.1	0.2			
	MAX	4.5	0.7	2.0	3.4			
	MIN	3.5	-0.2	-0.8	-0.1			
	AVG	3.7	0.0	0.3	0.4			
	STD	0.2	0.2	0.5	0.7			
	Open	0	0	0.0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B / Gp A		
	Product: Series IPBD Connector					File #: 20273004		
	Description: Sample ID# B-A1-4							
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	32	37	34			
	Date:	05Dec02	06Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.7	0.0	0.1	0.4			
	2	3.7	0.0	0.1	1.1			
	3	3.7	0.0	0.1	1.0			
	4	3.7	0.1	0.6	0.5			
	5	3.8	0.0	0.2	0.5			
	6	3.7	0.0	0.3	1.3			
	7	3.7	0.1	0.1	0.5			
	8	3.8	0.0	0.3	2.0			
	9	3.7	-0.1	0.2	1.1			
	10	3.6	0.0	0.1	0.7			
	11	3.8	0.0	0.3	0.7			
	12	3.6	0.1	0.2	0.7			
	13	3.6	0.1	0.2	0.4			
	14	3.5	0.1	0.3	0.5			
	15	3.8	0.0	0.3	0.9			
	16	4.0	0.0	0.7	1.3			
	17	3.5	0.1	0.1	0.3			
	18	3.7	0.0	0.1	0.2			
	19	3.7	0.1	0.1	0.4			
	20	3.9	0.0	0.2	0.6			
	21	3.6	0.0	0.1	0.4			
	22	3.7	0.0	0.1	0.2			
	23	3.6	0.1	0.1	0.2			
	24	3.7	0.1	0.3	0.5			
	25	3.8	0.0	0.2	0.3			
	MAX	4.0	0.1	0.7	2.0			
	MIN	3.5	-0.1	0.1	0.2			
	AVG	3.7	0.0	0.2	0.7			
	STD	0.1	0.1	0.2	0.4			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B / Gp A		
	Product: Series IPBD Connector					File #: 20273005		
	Description: Sample ID# B-A1-5							
	Open circuit voltage: 20mv					Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	30	37	34			
	Date:	05Dec02	09Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.8	0.1	0.8	1.3			
	2	3.7	0.1	0.7	0.8			
	3	3.7	0.0	0.7	0.5			
	4	3.6	0.0	0.8	0.3			
	5	3.7	0.0	0.1	0.1			
	6	3.7	0.0	0.3	0.2			
	7	3.7	0.1	0.3	0.3			
	8	4.3	-0.1	1.1	3.6			
	9	3.7	0.0	0.4	1.0			
	10	3.6	0.1	0.3	0.4			
	11	3.8	0.0	0.3	0.4			
	12	3.6	0.0	0.2	0.1			
	13	3.7	-0.1	0.1	0.1			
	14	3.6	0.0	0.3	0.3			
	15	3.7	-0.1	0.3	0.3			
	16	3.7	-0.1	0.1	0.2			
	17	3.7	-0.1	0.1	0.3			
	18	4.1	-0.2	0.4	0.7			
	19	3.7	-0.1	0.1	0.0			
	20	3.9	0.0	0.5	0.7			
	21	3.7	-0.1	0.1	0.1			
	22	3.7	0.0	0.3	0.3			
	23	3.8	0.0	0.2	0.3			
	24	3.8	-0.1	0.3	0.5			
	25	3.7	-0.1	0.4	0.4			
	MAX	4.3	0.1	1.1	3.6			
	MIN	3.6	-0.2	0.1	0.0			
	AVG	3.7	0.0	0.4	0.5			
	STD	0.2	0.1	0.3	0.7			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B /Gp A		
	Product: Series IPBD Connector					File #: 20273006		
	Description: Sample ID# B-A1-6							
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	30	37	34			
	Date:	05Dec02	09Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.6	0.0	0.2	0.6			
	2	3.9	-0.1	0.4	1.6			
	3	3.5	0.1	0.4	0.4			
	4	3.5	0.1	0.3	0.2			
	5	3.6	0.0	0.2	0.4			
	6	3.8	-0.1	0.2	0.4			
	7	3.7	-0.1	0.1	0.2			
	8	3.6	-0.1	0.4	1.0			
	9	3.6	0.0	0.3	0.5			
	10	3.7	-0.1	0.1	0.2			
	11	3.6	0.0	0.3	0.6			
	12	3.8	0.1	0.7	1.0			
	13	3.6	0.0	0.5	1.0			
	14	3.8	-0.1	0.2	0.4			
	15	3.6	0.0	0.1	0.1			
	16	3.6	-0.1	0.2	0.5			
	17	3.6	-0.1	0.2	0.6			
	18	3.5	0.1	0.5	1.0			
	19	3.6	0.0	0.1	0.1			
	20	3.7	0.0	0.5	1.5			
	21	3.7	-0.1	0.1	0.2			
	22	3.6	0.0	0.1	0.3			
	23	3.6	0.0	0.4	0.9			
	24	3.5	0.1	0.9	0.8			
	25	3.5	0.1	0.5	0.6			
	MAX	3.9	0.1	0.9	1.6			
	MIN	3.5	-0.1	0.1	0.1			
	AVG	3.6	0.0	0.3	0.6			
	STD	0.1	0.1	0.2	0.4			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B /Gp A		
	Product: Series IPBD Connector					File #: 20273007		
	Description: Sample ID# B-A1-7							
	Open circuit voltage: 20mv					Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	30	37	34			
	Date:	05Dec02	09Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.6	0.2	0.6	2.2			
	2	3.5	0.1	0.5	3.3			
	3	3.7	0.2	0.7	4.7			
	4	3.5	0.1	0.3	0.7			
	5	3.5	0.1	0.3	0.7			
	6	3.6	0.1	0.2	0.6			
	7	3.5	0.1	0.2	0.1			
	8	3.6	0.1	0.7	1.7			
	9	3.8	-0.3	0.2	1.1			
	10	3.6	-0.1	0.5	2.2			
	11	3.6	-0.1	0.2	1.7			
	12	3.9	-0.2	-0.1	0.2			
	13	3.5	0.1	0.4	1.1			
	14	3.5	0.1	0.3	0.6			
	15	3.7	-0.1	0.1	0.8			
	16	3.7	-0.1	0.1	0.5			
	17	3.6	0.1	0.4	0.7			
	18	3.4	0.4	1.0	3.5			
	19	3.6	0.0	0.1	0.2			
	20	3.5	0.1	0.1	0.1			
	21	3.5	0.0	0.0	0.4			
	22	3.6	-0.1	0.0	0.2			
	23	3.6	-0.1	0.0	0.5			
	24	3.5	0.2	0.6	1.7			
	25	3.5	0.1	0.5	0.9			
	MAX	3.9	0.4	1.0	4.7			
	MIN	3.4	-0.3	-0.1	0.1			
	AVG	3.6	0.0	0.3	1.2			
	STD	0.1	0.2	0.3	1.2			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



			Low Level Contact Resistance					
	Project: 202730					Spec: EIA 364, TP 23		
	Customer: Samtec					Subgroup: Seq B /Gp A		
	Product: Series IPBD Connector					File #: 20273008		
	Description: Sample ID# B-A1-8							
	Open circuit voltage:		20mv			Current:	10ma	
				Delta values				
				units: milliohms				
	Temp °C	20	20	21	20			
	R.H. %	30	30	37	34			
	Date:	05Dec02	09Dec02	16Dec02	27Dec02			
	Pos. ID	Initial	Dur.30X	T-Shock	Hum			
				100cycles				
	1	3.5	0.1	0.5	0.9			
	2	3.6	0.1	0.4	1.2			
	3	3.4	0.1	0.6	1.1			
	4	3.6	0.2	0.9	1.1			
	5	4.2	-0.2	0.2	2.9			
	6	3.6	0.0	0.0	0.1			
	7	3.8	-0.1	-0.1	0.1			
	8	3.8	0.3	0.1	1.4			
	9	3.7	-0.1	0.1	1.8			
	10	3.6	-0.1	0.1	1.2			
	11	3.6	0.0	0.4	2.3			
	12	3.4	0.1	0.5	1.3			
	13	3.7	-0.3	0.0	0.3			
	14	3.8	0.4	0.1	0.7			
	15	3.7	0.0	0.3	0.9			
	16	3.6	0.0	0.2	0.5			
	17	3.5	0.1	0.4	1.0			
	18	3.6	-0.1	0.1	1.1			
	19	3.7	-0.1	-0.1	0.1			
	20	3.7	-0.1	-0.1	0.1			
	21	3.6	0.0	0.1	0.2			
	22	3.7	-0.1	0.0	0.1			
	23	3.7	-0.1	0.1	0.5			
	24	3.6	-0.1	0.2	0.7			
	25	3.6	0.0	0.4	1.0			
	MAX	4.2	0.4	0.9	2.9			
	MIN	3.4	-0.3	-0.1	0.1			
	AVG	3.7	0.0	0.2	0.9			
	STD	0.2	0.1	0.2	0.7			
	Open	0	0	0	0			
	Tech	S-R	S-R	S-R	DAM			
	Equip ID	594	594	594	323			
		236	236	236	297			



TEST RESULTS

SEQUENCE C

Group A



PROJECT NO.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# C-A-1, C-A-2 TECHNICIAN: SR

START DATE: 12/12/02 COMPLETE DATE: 12/12/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 36%

EQUIPMENT ID#: 553, 684, 1167, 1168, 1169, 1175, 1271, 1272, 1366

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 #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

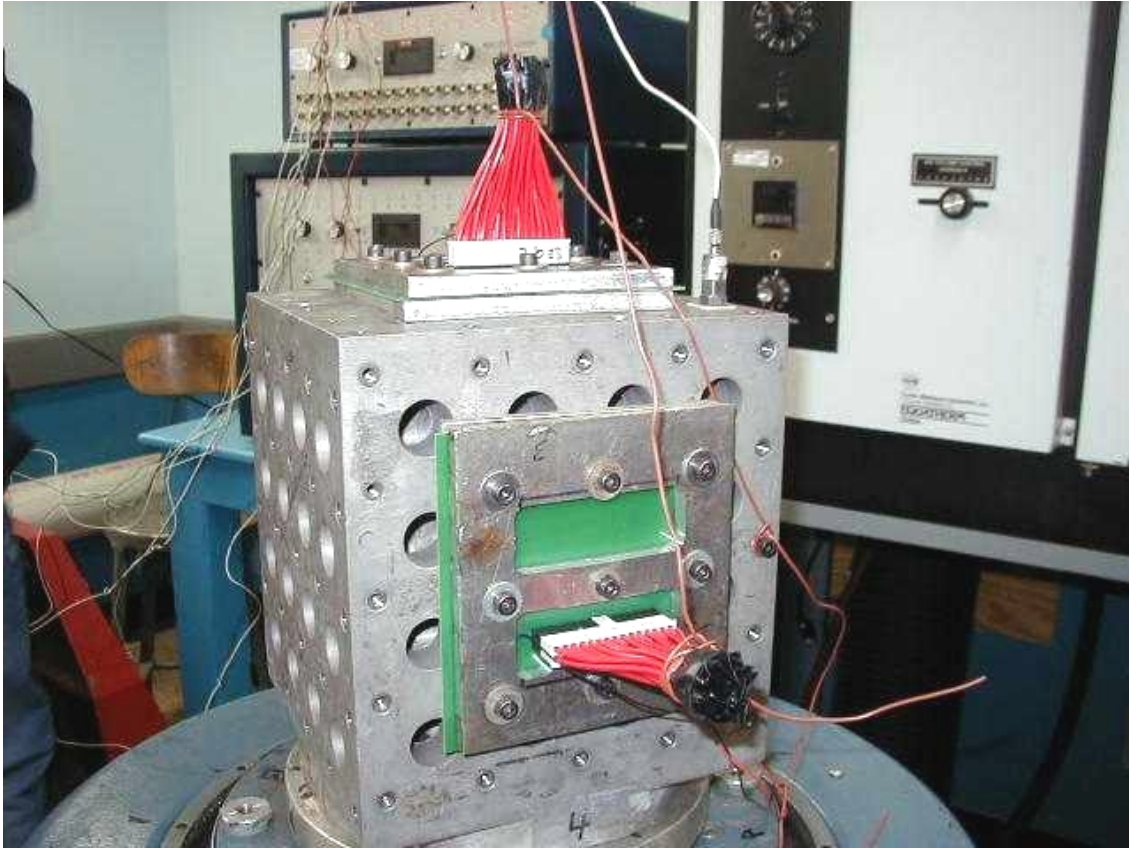
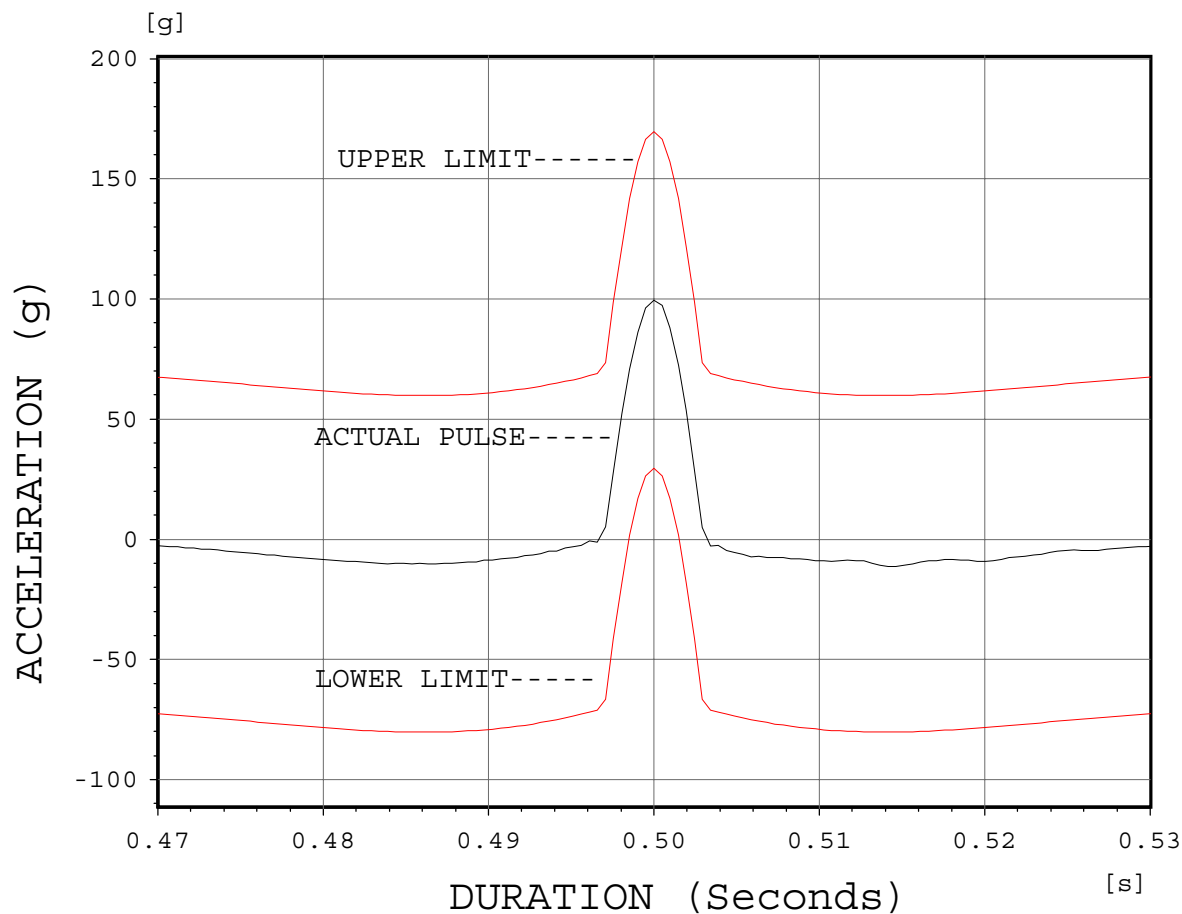


FIGURE #5

Classical Shock

Channel 1



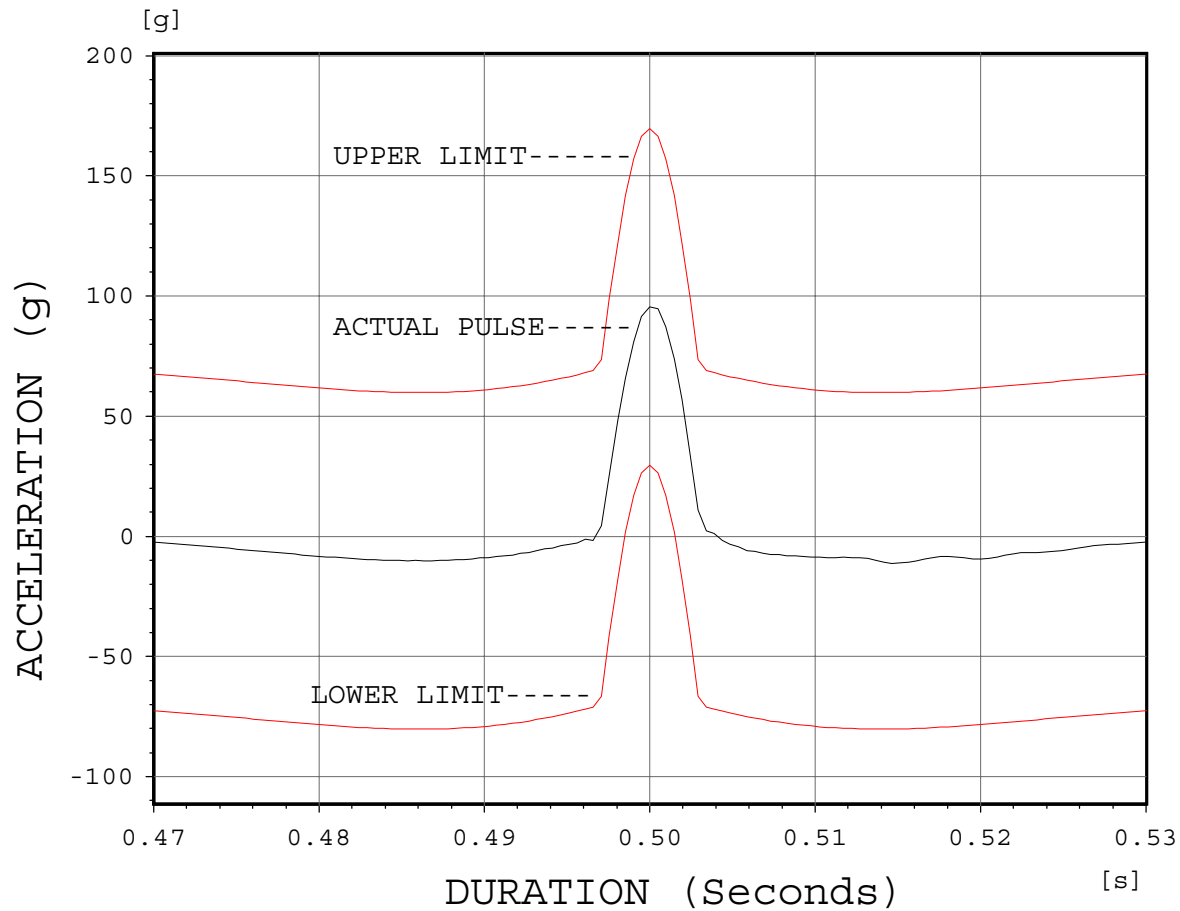
Project-202730
Samtec
Cal Wave 1
12/12/02
Tech:S-R/



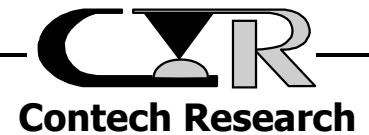
FIGURE #6

Classical Shock

Channel 1



Project-202730
Samtec
Actual Wave 1
12/12/02
Tech:S-R/



PROJECT NO.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# C-A-1, C-A-2 TECHNICIAN: SR

START DATE: 12/13/02 COMPLETE DATE: 12/13/02

ROOM AMBIENT: 21°C RELATIVE HUMIDITY: 35%

EQUIPMENT ID#: 553, 684, 1166, 1167, 1168, 1169, 1175, 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 VB.
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 D

Group A



PROJECT NO.: 202730 SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# D-A-1, D-A-2 TECHNICIAN: SR

START DATE: 12/4/02 COMPLETE DATE: 12/4/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 30%

EQUIPMENT ID#: 419, 584, 650, 689

VOLTAGE DROP

PURPOSE:

To determine the electrical resistance of the contact system under conditions where the applied current levels are at the rated current of the contact.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 06.
2. Test Conditions:
 - a) Test Current (Amps) : 6.0 Amps
 - b) No. of Observations : 6 per sample
3. The points of application were in accordance with Figure #7.

REQUIREMENTS:

When the specified rated current is applied, the voltage drop shall be measured and recorded.

RESULTS: See next page.



RESULTS:

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

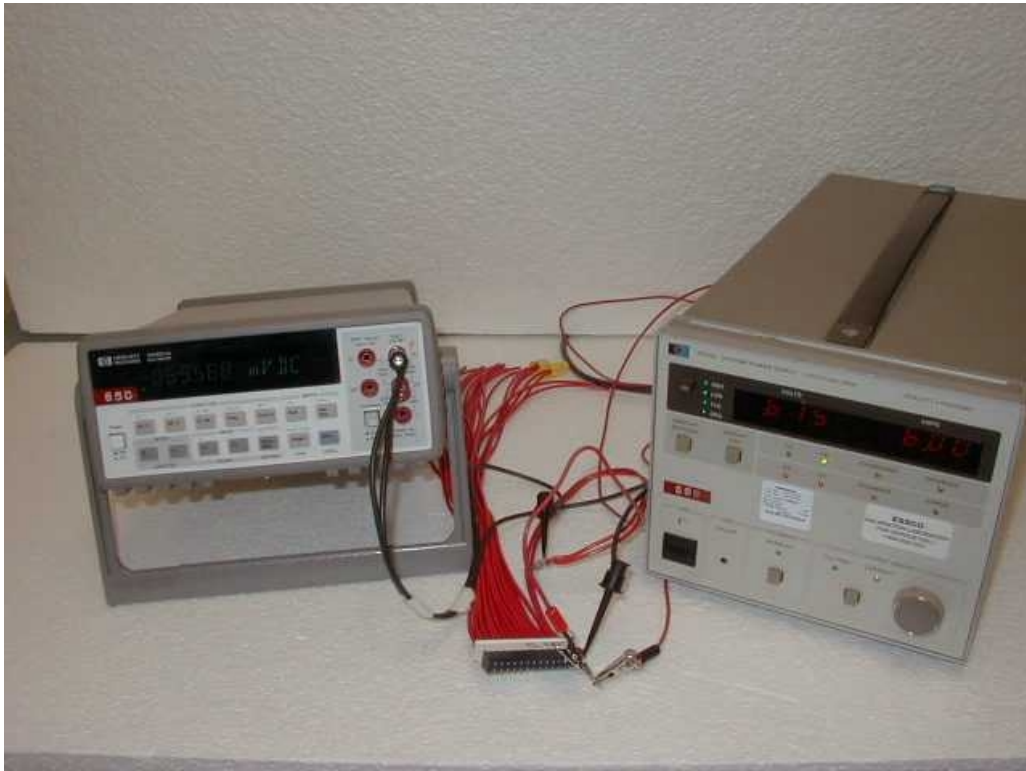
<u>Sample ID#</u>	<u>VOLTAGE DROP</u> <u>(Millivolts)</u>		
	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
D-A-1	67.9	68.7	67.4
D-A-2	67.5	70.2	66.3

2. See data file 202730VD01 for individual data points.



FIGURE #7

Typical Voltage Drop Set up



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18

PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# D-A-1, D-A-2

TECHNICIAN: SR/MHB

START DATE: 12/9/02

COMPLETE DATE: 12/30/02

ROOM AMBIENT: 20°C

RELATIVE HUMIDITY: 30%

EQUIPMENT ID#: 25, 419, 584, 650, 667, 689

CURRENT CYCLING

PURPOSE:

To determine the impact current cycling was on the electrical performance of the connectors.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 55, Test Condition B, Test Method 4.
2. Test Conditions:
 - a) Test Current : 7.5 amps
 - b) Cycle Time : ON - 45 minutes
OFF- 15 minutes
 - c) Number of Cycles : 500
3. The test specimen was placed in a chamber or room which prevents air currents and the like from influencing the observations.
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:

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



REQUIREMENTS: Continued

2. The voltage drop shall be measured and recorded at 250 and 500 cycles of current cycling.

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:

<u>Sample ID#</u>	<u>VOLTAGE DROP</u> <u>(Millivolts)</u>					
	<u>250 Cycles</u>			<u>500 Cycles</u>		
	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	<u>Max.</u>	<u>Min.</u>
D-A-1	68.4	68.9	67.8	67.8	68.0	67.4
D-A-2	69.3	72.2	66.4	70.0	73.5	67.0

3. See data file 202730VD01 for individual data points.



PROJECT	202730	TEST :	Voltage Drop	REQ. :	Record
SPEC :	Ref: EIA 364	PAR. :	T.P. 6	TECH :	S-R
START :	12/4/02	SAMPLE I.D. # :	D-A-1, D-A-2	FILE:	202730VD01
FINISH :	12/30/02	TEMP :°C	20	R.H. %	30
EQUIPMENT I.D. #:	689, 419, 584, 650	current :	6.0 amps		

[illegible]

TEST RESULTS

SEQUENCE E

Group A



PROJECT NO.: 202730

SPECIFICATION: TC0245-0036

PART NO.: IPBD-115-01-T-D-12-18 PART DESCRIPTION: IPBD
Connectors

SAMPLE SIZE: ID# E-A-1, E-A-2, E-A-3, E-A-4
TECHNICIAN: SR

START DATE: 12/30/02 COMPLETE DATE: 12/30/02

ROOM AMBIENT: 20°C RELATIVE HUMIDITY: 40%

EQUIPMENT ID#: 1, 55, 171, 609

SOLVENT RESISTANCE

PURPOSE:

To determine the ability of the plastic housing to withstand normal cleaning solvents without damage. The solvent used is considered severe. If, however, the plastic remains stable and undamaged when so exposed it is considered to be immune to all the common solutions available.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 11A, Table 1.
2. The test samples were exposed to each of the solutions indicated below.
3. An appropriate size beaker large enough to accept the connectors to be tested was selected.
4. The beaker was filled to a level sufficient to cover the samples plus 1.0" with the chemicals listed below.

Description	Temperature	Time (Minutes)
a) Ionox FCR	65.6 C	5
b) Axarel 32	60.0 C	10
c) B10ACT EC-15	71.1 C	10
d) Synergy CCS	25.0 C	10

* 1 Sample is exposed to each chemical.



PROCEDURE: Continued

5. The solution was heated to the temperatures indicated for a 15 minute time period prior to exposing the connectors and was maintained at the level for the duration of the test.
6. The test samples were immersed in the solution and allowed to stand for the period of time specified.
7. The test samples were allowed to cool to room temperature.
8. All test samples were visually examined under 10X magnification after 5 minutes of drying.
9. The weight of each sample was determined prior to and following exposure.
10. Prior to performing variable measurements, the test samples were allowed to recover to room ambient conditions.

REQUIREMENTS:

1. The marking shall be complete and legible.
2. There shall be no evidence of discoloration, degradation or physical damage to the plastic housing.

RESULTS:

All samples so tested met the requirements specified.

