

AUGUST 3, 1992

TEST REPORT # 92304

QUALIFICATION TESTING

ICF-316-S-O

ICF-316-T-O

SAMTEC CORPORATION



APPROVED BY: MAX PEEL
PRESIDENT AND DIRECTOR OF ADVANCED RESEARCH
CONTECH RESEARCH, INC.



CERTIFICATION

This is to certify that the evaluation described herein was designed and executed by personnel of Contech Research, Inc. It was performed with the concurrence of Samtec Corporation 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 MIL-STD-45662, as applicable.

All data, raw and summarized, analysis and conclusions presented herein are the property of the test sponsor. No copy of this report, in part or in full, shall be forwarded to any agency, customer, etc., by Contech Research without the written approval of the sponsor.



Max Peel
President

MP/JS



SCOPE

To perform qualification testing on "Dip Sockets" as manufactured and submitted by the test sponsor, Samtec Corporation.

TEST SAMPLES AND PREPARATION

1. The following test samples were submitted by the test sponsor, Samtec Corporation, for the evaluation to be performed by Contech Research, Inc.
 - a) ICF-316-S-0, Dip Socket, Gold Plated, SMT
 - b) ICF-316-T-0, Dip Socket, Tin Plated, SMT
 - c) DIP'S, Tin Plated
2. Unless otherwise indicated, all materials were certified by the manufacturer to be in accordance with the applicable product specification.
3. The test samples as submitted were certified by the manufacturer as being fabricated and assembled utilizing normal production techniques common for this type of product and inspected in accordance with the quality criteria as established for the product involved.
4. All test samples were coded and identified to maintain continuity throughout the test sequences.
5. Special test boards were supplied by the Test Sponsor. Said test board had special SMT patterns of various configurations. The pattern used for this program was identified as "SSM-DH."
6. Solder paste was applied to the test pad areas using a stencil.
7. The solder paste used was:

Manufacturer :	Enplate
Mesh Size :	270/400
Alloy :	63137, SnPb
8. The boards were thermally treated after solder paste application for 15 minutes at 125°C.
9. The connectors were then assembled to the prepared test board and vapor phase reflowed with the following conditions.

Preheat :	20 Seconds at 97°C
Reflow :	30 Seconds at 217°C
Cool :	15 Seconds at 97°C



TEST SAMPLES AND PREPARATION -- Continued:

10. After test lead attachment and/or soldering, all test units were cleaned prior to mating via DI water wash, isopropyl alcohol rinse, and vapor degreasing (in the order indicated).
11. Unless otherwise specified in the test procedures used, no further preparation was used.
12. All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to MIL-STD-45662, as applicable.

TEST SELECTION

1. The following test groups were established :

Group 1 : Vibration/Shock Series (LLCR)
Group 2 : Vibration/Shock Series (Contact Interruptions)
Group 3 : Thermal Shock/Cyclic Humidity Series (LLCR)

MONITORING TESTS

Throughout the test sequences selected for this evaluation one test was performed on a periodic basis. The following is the rationale for this test which is significant and important in evaluating the data in proper perspective.

LOW LEVEL CIRCUIT RESISTANCE

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.
2. The test method is also sensitive to and may detect the presence of fretting corrosion induced by mechanical or thermal environments and any significant loss of contact pressure.
3. This attribute was monitored after each preconditioning and/or test exposure in order to determine said stability of the connector material systems as they progress through the applicable test sequences.
4. The electrical stability of the system is determined by comparing the resistance value after a given test exposure to its initial value (prior to any exposure). The difference is the change in resistance occurring whose magnitude establishes the stability of the interface being evaluated.
5. The test is performed with a four wire system. The test is performed in accordance with MIL-STD-1344, Method 3002 with a 100 milliamp maximum test current and an open circuit voltage of 20 millivolts. Measurements are taken in the forward and reverse direction and averaged.
6. In order to categorized the change occurring in the low level circuit resistance in the test sequences performed, the following guidelines are used:
 - a) <5.0 milliohm change: Stable
 - b) 5.1 to 10.0 : Stable with minor changes
 - c) 10.1 to 15.0 : Stable with significant change
 - d) 15.1 to 25.0 : Marginal stability in non-benign applications.
 - e) 25.1 to 50.0 : Unstable in non-benign applications. Marginal in benign applications.
 - f) >50.1 : Unstable

DATA SUMMARY

<u>TEST</u>	<u>REQUIREMENTS</u>	<u>RESULTS</u>	
<u>Group 2</u>		<u>Gold</u>	<u>Tin</u>
LLCR	< 10.0 mΩ	< 7.1 mΩ	< 6.2 mΩ
Mating Force	Record	<12.2 lbs.	< 13.5 lbs.
Unmating Force	Record	> 1.4 lbs.	> 4.5 lbs.
Durability	No damage	Passed	Passed
Mating Force	Record	<13.0 lbs.	< 10.7 lbs.
Unmating Force	Record	> 3.0 lbs.	< 3.5 lbs.
LLCR	<+ 5.0 mΩ	< 2.2 mΩ	< +1.6 mΩ
Vibration	No damage	Passed	Passed
LLCR	<+15.0 mΩ	<+5.1 mΩ	< +3.7 mΩ
Shock	No damage	Passed	Passed
LLCR	<+15.0 mΩ	<+8.7 mΩ	<+11.4 mΩ
<u>Group 3</u>			
Engagement Forces	Record	< 0.8 oz.	< 1.6 oz.
Separation Forces	Record	> 0.5 oz.	> 1.0 oz.
Mating Forces	Record	< 9.0 lbs.	<16.0 lbs.
Unmating Forces	Record	> 1.5 lbs.	> 6.5 lbs.
Durability	No damage	Passed	Passed
Mating Forces	Record	< 7.0 lbs.	< 9.0 lbs.
Unmating Forces	Record	> 3.7 lbs.	> 4.2 lbs.
Vibration	No damage	Passed	Passed
	1.0 microsecond	Passed	Passed
Shock	No damage	Passed	Passed
	1.0 microsecond	Passed	Passed
<u>Group 4</u>			
LLCR	15.0 mΩ	< 7.1 mΩ	< 5.9 mΩ
Durability	No damage	Passed	Passed
LLCR	+ 5.0 mΩ	<+2.4 mΩ	<+0.7 mΩ
Thermal Shock	No damage	Passed	Passed
LLCR	+15.0 mΩ	<+3.2 mΩ	<+2.1 mΩ
Cyclic Humidity	No damage	Passed	Passed
LLCR	+15.0 mΩ	<+5.3 mΩ	< 2.6 mΩ

LLCR = Low Level Circuit Resistance
 DWV = Dielectric Withstanding Voltage



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Equipment List

ID#	Last Cal	Next Cal	Equipment Name	Manufacturer	Accuracy	Model #	Serial #	Freq Cal
1	7/16/92	1/16/93	Digital Thermometer	John Fluke MFG	±0.31°C	2190A	2775012	6 months
14	1/3/92	1/3/93	Accelerometer Kit	PCB Piezotronics	±2%	302A	7040	12 months
22			N2 Chamber	Hot Pack	±2°C	1507-26	45214	Each Test
27	2/19/92	8/19/92	Temp/Hum Cycle	Blue M Company	±1% of span	FR-256PC-1	F2-249	3 months
30	4/30/92	10/30/92	Discontinuity Monitor	Associated Test Lab	± 50 ns	DM-600-10	382-1	6 months
33			Vib. Power Amp	Ling Dynamics	See specification	MPA4	149	N/A
34			Shock Machine	Avco	See ID# 14 & 117	SM110-3	1047	Each Test
45			Plotter	Hewlett Packard	N/A	7225B	2106A03238	N/A
107			Bench Oven	Blue M Company	±0.5%	POM7-146C	P38-1604	Each Test
113			Large Oven	Blue M Company	N/A	POM-166E	P6-2724	Each Test
114	5/19/92	11/19/92	Digital Force Gage	Chatillon	±1%	DFG-2	3985	6 months
115	7/14/92	7/14/93	Vibration Controller	B & K	±4%	1047	1162161	12 months
117	3/12/92	9/12/92	Oscilloscope	Hewlett Packard	See specification	54200	2445A 00127	6 months
150			Drill Press Stand	Craftsman	N/A	25921	N/A	N/A
152			Drill Press Stand	Craftsman	N/A	25921	N/A	N/A
159	5/19/92	11/19/92	Force Gage (30 lbs.)	Chatillon	2.5% of full scale	DPP-30	3884	6 months
222			PCB Power Supply	PCB Piezotronics	N/A	482	3782	N/A
223			PCB Power Supply	PCB Piezotronics	N/A	482	4356	N/A
297	4/14/92	10/14/92	Microhm Meter	Keithley Company	See manual	580	485414	6 months
315			X - Y Table	N.E. Affiliated Tech.	N/A	XY-6060	N/A	N/A
322			Computer	Legatech	See manual	286-12	N/A	N/A

TEST RESULTS

Vibration/Shock Series (LLCR)

Group 2



PROJECT NO.:	92304	SPECIFICATION:	N/A
PART NO.:	ICF-316-S-O ICF-316-T-O	PART DESCRIPTION:	Dip Sockets
SAMPLE SIZE:	Two Each	TECHNICIAN:	DAM
START DATE:	7-15-92	COMPLETE DATE:	7-15-92
ROOM AMBIENT:	24°C	RELATIVE HUMIDITY:	60%
EQUIPMENT ID#:	152, 159, 315		

MATING AND UNMATING FORCE

PURPOSE:

To determine the mechanical forces required to mate and unmate the test samples with all guiding and applicable hardware assembled to the test samples.

PROCEDURE:

1. The test was performed in accordance with MIL-STD-1344, Method 2013.
2. The test samples were fixtured to the base plate of the test stand and applicable force gauge.
3. The fixturing was accomplished to assure axial alignment and allowed self centering movement to exist.
4. The test rate was 1.0 inch/minute.

REQUIREMENTS:

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

RESULTS: See next page

RESULTS:

The following is a summary of the observed forces measured and recorded.

<u>Sample ID#</u>	<u>MATING FORCE</u> <u>(Pounds)</u>	<u>UNMATING FORCE</u> <u>(Pounds)</u>
A) <u>ICF-316-S-O</u>		
1	12.2	2.7
2	9.0	1.4
B) <u>ICF-316-T-O</u>		
1	13.0	4.5
2	13.5	5.7

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-O PART DESCRIPTION: Dip Sockets
ICF-316-T-O

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-15-92 COMPLETE DATE: 7-15-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 60%

EQUIPMENT ID#: 297, 322

LOW LEVEL CIRCUIT RESISTANCE (LLCR)

PURPOSE:

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 pressure.

PROCEDURE:

1. This test was performed in accordance with MIL-STD-1344, Method 3002 with a 100 milliamp maximum test current and an open circuit voltage of 20 millivolts (four wire technique).
2. The voltage probes were attached to the contact terminations on the solder side of the test board within 0.060" of the board surface.

REQUIREMENTS:

The low level circuit resistance as measured shall not exceed 10.0 mΩ.

RESULTS: See Next Page

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>	<u>Std.</u> <u>Dev.</u>
A) <u>ICF-316-S-Q</u>				
1	5.6	6.5	4.1	0.9
2	6.5	7.1	5.4	0.5
B) <u>ICF-316-T-Q</u>				
1	3.9	4.3	3.6	0.2
2	4.4	6.2	3.5	1.1

2. See pages 17c through 17f for individual data points.

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-C PART DESCRIPTION: Dip Sockets
ICF-316-T-O

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-16-92 COMPLETE DATE: 7-16-92

ROOM AMBIENT: 23°C RELATIVE HUMIDITY: 62%

EQUIPMENT ID#: Manual, 152, 159, 297, 315, 322

DURABILITY

PURPOSE:

1. To determine the effects of subjecting the test samples to a predetermined number of mating and unmating cycles simulating the expected mechanical life of the of the product being evaluated.
2. 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 asses any impact on electrical stability resulting from wear or other wear dependent phenomenon.

PROCEDURE:

1. The test was performed in accordance with MIL-STD-1344, Method 2016.
 2. Test Conditions:
 - a) No. of Cycles : 10
 - b) Rate : Manual
 6. Low level circuit resistance was performed in accordance with MIL-STD-1344, Method 3002 using a 100 milliamp maximum test voltage and a 20.0 millivolt open circuit voltage.
-

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples so tested.
2. The force required to mate and unmate the test samples shall be measured and recorded.
5. The change in low level circuit resistance shall not exceed +5.0 m Ω .

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:

LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg. Change</u>	<u>Max Change</u>	<u>Std. Dev.</u>
<u>ICF-316-S-0</u>						
1	6.3	8.5	3.6	+0.7	+2.2	1.3
<u>ICF-316-T-0</u>						
1	4.5	5.6	3.5	+0.6	+1.6	0.6

3. See pages thru for individual data points.
4. The following is a summary of the data observed:

<u>Sample ID#</u>	<u>MATING FORCE (Pounds)</u>	<u>UNMATING FORCE (Pounds)</u>
ICF-316-S-0 #1	13.0	3.0
ICF-316-T-0 #1	10.7	3.5

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-O PART DESCRIPTION: Dip Sockets
ICF-316-T-O

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-22-92 COMPLETE DATE: 7-23-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 64%

EQUIPMENT ID#: 33, 115, 223, 297, 322

VIBRATION, SINUSOIDAL

PURPOSE:

1. To evaluate the test samples to determine if fretting corrosion occurs due to mechanical motion. To evaluate the integrity of the test samples relative to a severe mechanical environment.
2. To determine the effects of vibration within the predominant vibration frequency range and magnitudes that may be encountered during the life of the product being evaluated.

PROCEDURE:

1. Low level circuit resistance was measured and recorded in accordance with MIL-STD-1344, Method 3002, with a 100 milliamp maximum test current and a 20.0 millivolt open circuit voltage.
2. Vibration was performed in accordance with MIL-STD-1344, Method 2005, Test Condition III.
3. Test Conditions:
 - a) Frequency : 10 to 2000 to 10 Hz
 - b) Amplitude : 0.06" da or 15 G's
 - c) Duration : 4.0 hrs/axis, 3 axis total
 - d) Test Current : 100 ma
 - e) Sweep Time : 20 minutes

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 shall not exceed +15.0 m Ω .

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:

LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg.</u> <u>Change</u>	<u>Max</u> <u>Change</u>	<u>Std.</u> <u>Dev.</u>
<u>ICF-316-S-Q</u>						
1 (Cycled)	7.2	11.6	3.7	+1.6	+5.1	1.8
2 (Uncycled)	6.7	11.4	3.9	+0.2	+4.8	2.1
<u>ICF-316-T-Q</u>						
1 (Cycled)	5.5	7.8	3.5	+1.6	+3.7	1.7
2 (Uncycled)	4.8	6.3	3.8	+0.4	+1.3	0.4

3. See pages 17c thru 17f for individual data points.

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-0 PART DESCRIPTION: Dip Sockets
ICF-316-T-0

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-23-92 COMPLETE DATE: 7-23-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 54%

EQUIPMENT ID#: 14, 34, 45, 117, 222, 297, 322

MECHANICAL SHOCK (SPECIFIED PULSE)

PURPOSE:

To determine the mechanical and electrical integrity of the test samples for use with electronic equipment subjected to shocks such as those expected from handling, transportation, etc.

PROCEDURE:

1. The shock test was performed in accordance with MIL-STD-1344, Method 2004, Test Condition A.
2. Test Conditions:
 - a) Peak value : 50 G
 - b) Duration : 11 milliseconds
 - c) Wave form : Half Sine
 - d) Velocity : 11.3 feet per second
 - e) No. of shocks : 3 shocks/direction, 3 axis (18 total)
3. Final low level circuit resistance was measured in accordance with MIL-STD-1344, method 3002 with a 100 milliamp maximum test current and a 20.0 millivolt open circuit voltage.

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples as tested.
2. The low level circuit resistance shall not exceed a change greater than +15.0 mΩ 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:

LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg. Change</u>	<u>Max Change</u>	<u>Std. Dev.</u>
<u>ICF-316-S-0</u>						
1 (Cycled)	5.8	9.3	3.5	+0.2	+2.8	1.5
2 (Uncycled)	7.5	15.3	4.1	+1.0	+8.7	3.5

ICF-316-T-0

1 (Cycled)	8.1	15.4	4.0	+4.2	+11.4	2.8
2 (Uncycled)	4.8	6.3	4.0	+0.4	+ 1.3	0.4

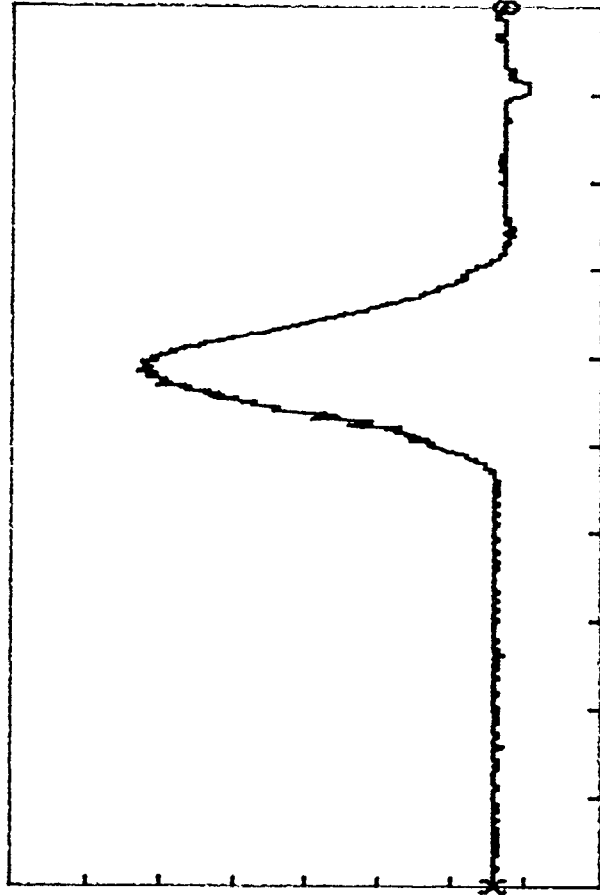
3. See pages 17c thru 17f for individual data points.
4. The following are the shock characteristics as shown in Figures #1 (calibration pulse), and #2 (test pulse):

<u>X-Axis (Duration)</u>	<u>Calibration</u>	<u>Test</u>
Delay 1 to 1: Duration time	11.18 ms	11.15 ms
Milliseconds per division	5.00 ms	5.00 ms
<u>Y-Axis (G Level)</u>		
MV/div x 0.1 G: G's/division	10.0 G's	10.0 G's
Vamp 1 x 0.1 : G level	50.3 G's	50.3 G's

Delay 1 to 1 = 11.18 ms V ampl 1 = 503 mV

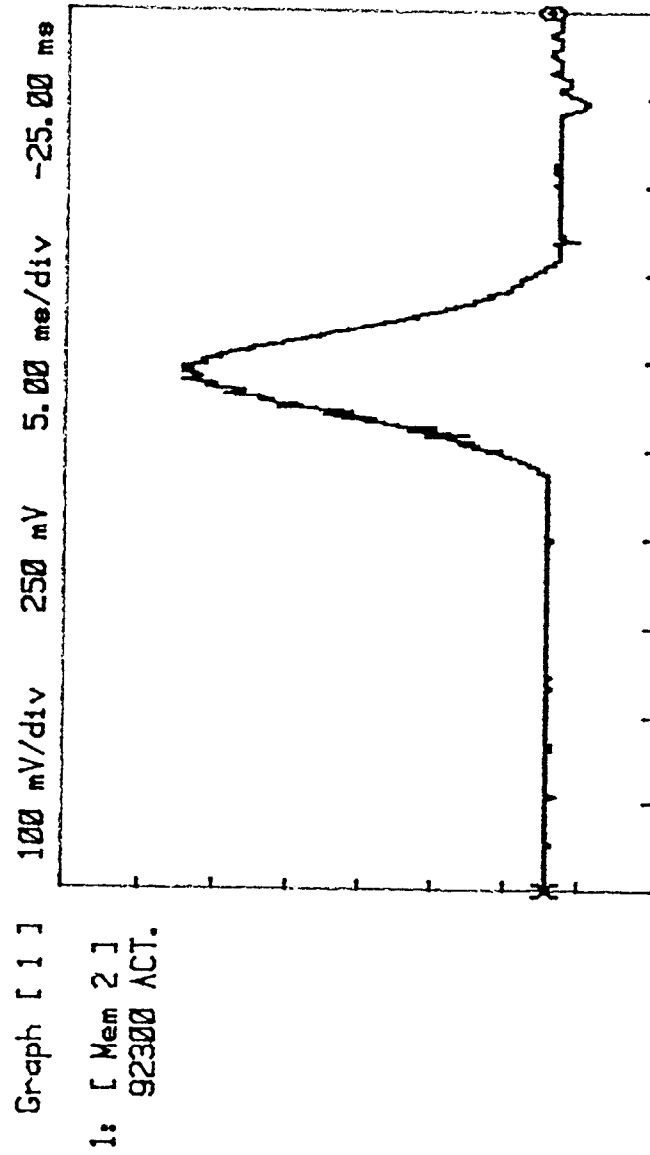
Graph [1] 100 mV/div 250 mV 5.00 ms/div -25.00 ms

1: [Mem 2]
92300 CAL.



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Delay 1 to 1 = 11.15 ms V ampl 1 = 503 mV



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LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
Customer: SAMTEC
Product: PN92034: ICF-316-S-0
Description: DIP SOCKET CONN# 1 GOLD

Spec: MIL-STD-1344 3002
SubGroup: 2 CYCLED
File #: 230401
Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms
Delta values

Temp °C	+24	+23	+24	+23
R.H. %	60	62	54	55
Date	15Jul92	16Jul92	23Jul92	24JUL92
Pos ID	INITIAL	DURA	VIB.	MECH. SH.
2	5.6	-2.0	+1.6	-1.7
3	4.6	-0.9	-0.4	-0.1
4	4.1	+2.2	+2.5	+0.3
5	4.5	+2.1	+1.7	-1.0
6	5.8	+0.2	+1.2	-2.1
7	4.8	+1.4	+2.1	-0.4
10	6.5	+2.0	+1.6	+1.7
11	6.3	+0.7	+1.3	+1.5
12	6.4	+0.9	+1.6	+2.8
13	6.3	+0.5	-2.6	-1.1
14	6.3	+1.5	+3.2	+1.7
15	6.5	+0.1	+5.1	+0.9
HIGH	6.5	+2.2	+5.1	+2.8
LOW	4.1	-2.0	-2.6	-2.1
AVG	5.6	+0.7	+1.6	+0.2
STD DEV	0.9	1.3	1.8	1.5
OPENS	0	0	0	0
INITIALS	DAM	DAM	DOM	DOM

NOTES:

- 1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
Customer: SAMTEC
Product: PN92304 ICF-316-S-0
Description: DIP SOCKET CONN#2 GOLD

Spec: MIL-STD-1344-3002
SubGroup: 2 UNCYCLED
File #: 230403
Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms

Delta values

Temp °C	+24	+24	+23
R.H. %	60	54	55
Date	15Jul92	23Jul92	24JUL92
Pos ID	INITIAL	VIB.	MECH. SH.
2	6.6	+1.1	+1.3
3	6.6	+1.7	+1.6
4	6.9	+1.5	+1.3
5	6.9	+1.5	+7.3
6	6.6	+4.8	+8.7
7	7.1	+0.6	+0.6
10	6.1	+0.0	-0.2
11	6.4	-2.5	-2.3
12	5.4	-0.4	-0.4
13	6.0	-2.0	-1.6
14	6.8	-2.7	-2.6
15	6.4	-1.5	-1.2

HIGH	7.1	+4.8	+8.7
LOW	5.4	-2.7	-2.6
AVG	6.5	+0.2	+1.0
STD DEV	0.5	2.1	3.5
OPENS	0	0	0

INITIALS	DAM	DOM	DOM
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NOTES:

- 1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
 Customer: SAMTEC
 Product: PN92304 ICF-316-T-0
 Description: DIP SOCKET CONN#1 TIN

Spec: MIL-STD-1344 3002
 SubGroup: 2 CYCLED
 File #: 230402
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms
 Delta values

Temp °C	+24	+23	+24	+23
R.H. %	60	62	54	55
Date	15Jul92	16Jul92	23Jul92	24JUL92
Pos ID	INITIAL	DURA	VIB.	MECH.SH.
2	3.9	+0.2	+0.1	+3.8
3	3.6	+0.6	+1.0	+1.0
4	3.7	+0.2	+0.0	+4.3
5	3.9	-0.3	-0.4	+3.1
6	3.8	+0.3	+0.0	+4.3
7	3.7	+0.3	+0.7	+5.6
10	3.9	+1.3	+3.2	+5.0
11	3.6	+0.7	+3.7	+4.1
12	4.3	+0.3	+3.4	+3.5
13	4.2	+0.4	+0.8	-0.2
14	4.0	+1.6	+3.7	+11.4
15	3.9	+1.3	+3.4	+5.0
HIGH	4.3	+1.6	+3.7	+11.4
LOW	3.6	-0.3	-0.4	-0.2
AVG	3.9	+0.6	+1.6	+4.2
STD DEV	0.2	0.6	1.7	2.8
OPENS	0	0	0	0
INITIALS	DAM	DAM	DOM	DOM

NOTES:

1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
 Customer: SAMTEC
 Product: PN92304 ICF-316-T-0
 Description: DIP SOCKET CONN#2 TIN

Spec: MIL-STD-1344 3002
 SubGroup: 2 UNCYCLED
 File #: 230404
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms
 Delta values

Temp °C	+24	+24	+23
R.H. %	60	54	55
Date	15Jul92	23Jul92	24JUL92
Pos ID	INITIAL	VIB.	MECH. SH.
2	3.8	+0.4	+0.2
3	3.6	+0.2	+0.6
4	3.7	+0.4	+0.3
5	3.7	+0.4	+0.4
6	3.7	+0.5	+0.5
7	3.6	+0.4	+0.9
10	5.9	+0.4	+0.4
11	5.7	+0.2	+0.2
12	6.0	-0.1	-0.2
13	6.2	-0.3	-0.3
14	3.8	+1.3	+1.3
15	3.5	+0.5	+0.6
HIGH	6.2	+1.3	+1.3
LOW	3.5	-0.3	-0.3
AVG	4.4	+0.4	+0.4
STD DEV	1.1	0.4	0.4
OPENS	0	0	0
INITIALS	DAM	DOM	DOM

NOTES:

- 1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

TEST RESULTS

Vibration/Shock Testing (Contact Interruptions)

Group 3

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-O PART DESCRIPTION: Dip Sockets
ICF-316-T-O

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-15-92 COMPLETE DATE: 7-15-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 60%

EQUIPMENT ID#: 114, 150

ENGAGEMENT AND SEPARATION FORCE

PURPOSE:

To determine the magnitude of mechanical forces required to mate and unmate the test samples to and from an individual socket contact.

PROCEDURE:

1. The test was performed in accordance with MIL-STD-1344, Method 2014.
2. Test Conditions:
 - a) Test Pin Diameter : 0.015 ± 0.0002 inches
 - b) No. of Observations : 15 positions/socket
 - c) Rate : 1.0 inch/minute
3. The test pin was cleaned with isopropyl alcohol after every ten measurements.

REQUIREMENTS:

1. The force required to engage and separate the test pin 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>ENGAGEMENT FORCE</u> <u>(Ounces)</u>			<u>SEPARATION FORCE</u> <u>(Ounces)</u>		
	<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg.</u>	<u>Max</u>	<u>Min.</u>
<u>ICF-316-S-O</u>						
3	0.7	0.8	0.6	0.5	0.7	0.5
4	0.7	0.8	0.6	0.5	0.6	0.5
<u>ICF-316-T-O</u>						
3	1.3	1.5	1.0	1.0	1.1	1.0
4	1.4	1.6	1.2	1.1	1.2	1.0

2. See pages 20a thru 20b for individual data points.

DATA SHEET

PROJECT: 92304
 SPEC: —
 STARTED: 15 July 92
 COMPLETED: 15 July 92
 EQUIPMENT I.D. #: 117 150

TEST: 100% Moisture
 PARAGRAPH: —
 SAMPLE I.D. #: G.P.S
 TEMP: 24 °C

REQ: 37 Record wt 2.0000
 T.P. — TECH: S.H.M
 Sample 24 Tin (Dial)
 R.H. 60 % UNITS: 0.1

TIN	Pcs#	Sample #3	Insertion	Withdrawal				
1	2		1.2	1.0				
2	3		1.4	1.1				
3	4		1.4	1.1				
4	5		1.5	1.1				
5	6		1.4	1.0				
6	7		1.4	1.1				
7	10		1.4	1.1				
8	11		1.2	1.1				
9	12		1.2	1.0				
10	13		1.4	1.0				
11	14		1.5	1.0				
12	15		1.0	1.0				
13								
14								
15								
16								
17								
TIN	Pcs#	Sample #4	Insertion	Withdrawal				
18	2		1.5	1.0				
19	3		1.6	1.0				
20	4		1.6	1.1				
21	5		1.5	1.2				
22	6		1.3	1.1				
23	7		1.4	1.1				
24	10		1.2	1.1				
25	11		1.3	1.0				
26	12		1.5	1.0				
27	13		1.5	1.1				
28	14		1.3	1.0				
29	15		1.5	1.1				
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
AVG:								
MAX:								
MIN:								



Contech Research, Inc.

DATA SHEET

PROJECT: 72504
 SPEC: -
 STARTED: 15 July 82
 COMPLETED: 15 July 82
 EQUIPMENT I.D. #: 104/150

TEST: Wet Chemical
 PARAGRAPH: -
 SAMPLE I.D. #: GP 3
 TEMP: 24 °C

REQ: 17 100% 2400
 T.P. - TECH: D. F. 201
 Samples 34 Gold (Dips)
 R.H. 60 % UNITS: 0.2

Gold	Pour	Sample #3	Insertion	Withdrawal				
1	2		.720	.528				
2	5		.656	.528				
3	4		.736	.500	*			
4	5		.688	.528				
5	6		.640	.500	*			
6	7		.592	.512				
7	10		.720	.656				
8	11		.704	.592				
9	12		.656	.528				
10	13		.600	.560				
11	14		.736	.500	*			
12	15		.688	.500	*			
13								
14								
15								
16								
17								
Gold	Pour	Sample #3	Insertion	Withdrawal				
18	2		.752	.528				
19	3		.616	.512				
20	4		.632	.528				
21	5		.784	.512				
22	6		.688	.528				
23	7		.720	.560				
24	10		.656	.512				
25	11		.762	.528				
26	12		.640	.500	*			
27	13		.752	.528				
28	14		.704	.528				
29	15		.752	.528				
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
AVG:								
MAX:								
MIN:								

* Pass 1/2 oz. Lead weight Technique



Contech Research, Inc.

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-Q PART DESCRIPTION: Dip Sockets
ICF-316-T-Q

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-15-92 COMPLETE DATE: 7-15-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 60%

EQUIPMENT ID#: 152, 159, 315

MATING AND UNMATING FORCE

PURPOSE:

To determine the mechanical forces required to mate and unmate the test samples with all guiding and applicable hardware assembled to the test samples.

PROCEDURE:

1. The test was performed in accordance with MIL-STD-1344, Method 2013.
2. The test samples were fixtured to the base plate of the test stand and applicable force gauge.
3. The fixturing was accomplished to assure axial alignment and allowed self centering movement to exist.
4. The test rate was 1.0 inch/minute.

REQUIREMENTS:

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

RESULTS: See next page.

RESULTS:

The following is a summary of the observed forces measured and recorded.

<u>Sample ID#</u>	<u>MATING FORCE</u> <u>(Pounds)</u>	<u>UNMATING FORCE</u> <u>(Pounds)</u>
<u>ICF-316-S-0</u>		
3	7.0	1.5
4	9.0	2.5
<u>ICF-316-T-0</u>		
3	14.5	6.5
4	16.0	7.5

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-0 PART DESCRIPTION: Dip Sockets
ICF-316-T-0

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-15-92 COMPLETE DATE: 7-15-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 60%

EQUIPMENT ID#: Manual, 152, 159, 315

DURABILITY

PURPOSE:

To determine the effects of subjecting the test samples to a predetermined number of mating and unmating cycles simulating the expected mechanical life of the of the product being evaluated.

PROCEDURE:

1. The test was performed in accordance with MIL-STD-1344, Method 2016.
2. Test Conditions:
 - a) No. of Cycles : 10
 - b) Rate : Manual

REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples so tested.
2. The force required to mate and unmate the test samples 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:

<u>Sample ID#</u>	<u>MATING FORCE</u> <u>(Pounds)</u>	<u>UNMATING FORCE</u> <u>(Pounds)</u>
ICF-316-S-0 #3	7.0	3.7
ICF-316-T-0 #3	9.0	4.2

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-0 PART DESCRIPTION: Dip Sockets
ICF-316-T-0

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-22-92 COMPLETE DATE: 7-23-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 64%

EQUIPMENT ID#: 30, 33, 115, 223

VIBRATION, SINUSOIDAL

PURPOSE:

To determine the effects of vibration within the predominant vibration frequency range and magnitudes that may be encountered during the life of the product being evaluated.

PROCEDURE:

1. Vibration was performed in accordance with MIL-STD-1344, Method 2005, Test Condition III.
2. Test Conditions:
 - a) Frequency : 10 to 2000 to 10 Hz
 - b) Amplitude : 0.06" da or 15 G's
 - c) Duration : 4.0 hrs/axis, 3 axis total
 - d) Test Current : 100 ma
 - e) Sweep Time : 20 minutes

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 interruption greater than 1.0 microsecond.

PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-O PART DESCRIPTION: Dip Sockets
ICF-316-T-O

SAMPLE SIZE: Two Each TECHNICIAN: DAM

START DATE: 7-23-92 COMPLETE DATE: 7-23-92

ROOM AMBIENT: 24°C RELATIVE HUMIDITY: 54

EQUIPMENT ID#: 14, 30, 34, 45, 117, 222

MECHANICAL SHOCK (SPECIFIED PULSE)

PURPOSE:

To determine the mechanical and electrical integrity of the test samples for use with electronic equipment subjected to shocks such as those expected from handling, transportation, etc.

PROCEDURE:

1. The shock test was performed in accordance with MIL-STD-1344, Method 2004, Test Condition A.
2. Test Conditions:
 - a) Peak value : 50 G
 - b) Duration : 11 milliseconds
 - c) Wave form : Half Sine
 - d) Velocity : 11.3 feet per second
 - e) No. of shocks : 3 shocks/direction, 3 axis (18 total)

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 following are the shock characteristics as shown in Figures #1 (calibration pulse), and #2 (test pulse):

	<u>Calibration</u>	<u>Test</u>
<u>X-Axis (Duration)</u>		
Delay 1 to 1: Duration time	11.18 ms	11.15 ms
Milliseconds per division	5.00 ms	5.00 ms
<u>Y-Axis (G Level)</u>		
MV/div x 0.1 G: G's/division	10.0 G's	10.0 G's
Vamp 1 x 0.1 : G level	50.3 G's	50.3 G's

TEST RESULTS

Thermal Shock/Cyclic Humidity (LLCR)

Group 4



PROJECT NO.: 92304 SPECIFICATION: N/A

PART NO.: ICF-316-S-O PART DESCRIPTION: Dip Sockets
ICF-316-T-O

SAMPLE SIZE: Four Each TECHNICIAN: DAM

START DATE: 7-8-92 COMPLETE DATE: 7-14-92

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 57%

EQUIPMENT ID#: Manual, 1, 22, 107, 113, 297, 322

THERMAL SHOCK

PURPOSE:

To determine the resistance of a given 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. Initial and all subsequent readings of low level circuit resistance was measured and recorded in accordance with MIL-STD-1344, Method 3002, with a 100 milliamp maximum test current and a 20.0 millivolt open circuit voltage. Voltage probe placement was in accordance with that previously indicated.
2. Measurements after completion of the exposure was performed when the test samples recovered to room ambient conditions.
3. Sample ID# 5 and 6 were cycled 10 times in accordance with the procedure as previously stated. After completion of said cycling low level circuit resistance was performed in accordance with item #1 above.
4. The test was performed in accordance with MIL-STD-1344, Method 1003, Test Condition A except as noted.
5. Test Conditions:
 - a) Number of Cycles : 5 cycles
 - b) Hot Extreme : +105°C +3°C/-0°C
 - c) Cold Extreme : -55°C +0°C/-3°C
 - d) Time at Temperature : 30 minutes
 - e) Mated Condition : Mated
 - f) Mounting Condition : Mounted

PROCEDURE -- Continued:

6. Two separate test chambers were utilized. One chamber was used for the high temperature extreme. The second chamber was used for the low temperature extreme using liquid nitrogen assist.
7. The total number of cycles were performed continuously.

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 +15.0 mΩ.

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:

LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

<u>Sample ID#</u>		<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg.</u> <u>Change</u>	<u>Max</u> <u>Change</u>	<u>Std.</u> <u>Dev.</u>
<u>ICF-316-S-0</u>							
ID# 7,	Initial	4.3	7.1	3.1	--	--	--
	Final	5.0	7.5	2.9	+0.7	+2.7	0.8
ID# 8,	Initial	4.3	5.4	3.6	--	--	--
	Final	4.9	6.1	4.0	+0.6	+2.3	0.7
ID# 5,	Initial	5.0	6.6	3.2	--	--	--
	After Dur.	5.6	6.9	3.8	+0.6	+2.0	0.6
	Final	6.3	8.2	3.9	+1.3	+2.7	1.0
ID# 6,	Initial	4.3	6.2	3.5	--	--	--
	After Dur.	5.1	6.9	3.5	+0.8	+2.4	1.1
	Final	5.6	7.8	3.7	+1.3	+3.2	1.2

RESULTS -- Continued:

LOW LEVEL CIRCUIT RESISTANCE
(Milliohms)

<u>Sample ID#</u>		<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg.</u> <u>Change</u>	<u>Max</u> <u>Change</u>	<u>Std.</u> <u>Dev.</u>
<u>ICF-316-T-C</u>							
ID# 7,	Initial	3.9	5.8	3.1	--	--	--
	Final	4.2	5.9	3.4	+0.3	+2.1	0.9
ID# 8,	Initial	3.6	4.0	3.1	--	--	--
	Final	4.0	6.0	2.5	+0.4	+2.0	0.9
ID# 5,	Initial	3.4	4.1	3.0	--	--	--
	After Dur.	3.1	3.9	2.2	-0.3	+0.7	0.5
	Final	3.3	3.9	2.4	-0.1	+0.6	0.4
ID# 6,	Initial	4.2	5.9	3.4	--	--	--
	After Dur.	3.8	4.3	3.5	-0.4	+0.6	1.1
	Final	3.9	4.9	3.0	-0.3	+0.7	0.9

3. See pages 34 thru 41 for individual data points.
4. The following are temperature ranges which occurred during the exposure:
 - a) Hot Temperature : +105.0°C to +105.4°C
 - b) Low Temperature : -55.2°C to -57.0°C

PROJECT NO.:	92304	SPECIFICATION:	N/A

PART NO.:	ICF-316-S-0 ICF-316-T-0	PART DESCRIPTION:	Dip Sockets

SAMPLE SIZE:	Two Each	TECHNICIAN:	DAM

START DATE:	7-14-92	COMPLETE DATE:	7-24-92

ROOM AMBIENT:	20°C	RELATIVE HUMIDITY:	58%

EQUIPMENT ID#:	27, 297, 322		

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, thermal cycling induces micromotion between contacting surfaces and humidity accelerates the oxidation process.
- b) Oxidation of wear debris resulting from induced micromotion which may have become entrapped between the contacting surfaces
- c) Oxidation of particulates which may have been deposited on the contacting surfaces from the surrounding atmosphere which may have been entrapped between them due to induce micromotion.
- d) Failure mechanisms resulting from a wet oxidation process.
- e) 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 was performed in accordance with MIL-STD-1344, Method 1002, Procedure II with the following conditions.

PROCEDURE -- Continued:

2. Test Conditions:

- a) Preconditioning (24 hours) : None
- b) Relative Humidity : 90 to 95
- c) Temperature Conditions : 25°C to 65°C
- d) Mating Conditions : Mated
- e) Mounting Conditions : Mounted
- f) Duration : 240 hours

3. Initial and all subsequent readings of low level circuit resistance was measured and recorded in accordance with MIL-STD-1344, Method 3002, with a 100 milliamp maximum test current and a 20.0 millivolt open circuit voltage. Voltage probe placement was in accordance with that previously indicated.

4. Measurements after completion of the exposure was performed when the test samples recovered to room ambient conditions.

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 +15.0 mΩ.

RESULTS:

- 1. The test samples as tested showed no evidence of physical deterioration.
- 2. 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>	<u>Avg.</u> <u>Change</u>	<u>Max</u> <u>Change</u>	<u>Std.</u> <u>Dev.</u>
<u>ICF-316-S-0</u>						
ID# 7, (Uncycled)	5.7	9.4	3.1	+1.2	+4.8	1.5
ID# 8, (Uncycled)	5.7	8.8	4.1	+0.9	+2.9	1.4
ID# 5, (Cycled)	6.1	9.9	4.3	+1.7	+5.3	1.7
ID# 6, (Cycled)	6.1	7.4	3.8	+1.9	+3.5	1.1

RESULTS - Continued

LOW LEVEL CIRCUIT RESISTANCE
(Millicohms)

<u>Sample ID#</u>	<u>Avg.</u>	<u>Max</u>	<u>Min.</u>	<u>Avg.</u> <u>Change</u>	<u>Max</u> <u>Change</u>	<u>Std.</u> <u>Dev.</u>
<u>ICF-316-T-0</u>						
ID# 7, (Uncycled)	4.6	6.0	3.0	+0.4	+2.2	0.9
ID# 8, (Uncycled)	4.2	6.1	3.1	+0.6	+2.2	0.9
ID# 5, (Cycled)	3.5	5.2	2.7	+0.1	+2.0	0.7
ID# 6, (Cycled)	4.4	6.2	3.6	+0.2	+2.6	1.2

3. See pages 34 thru 41 for individual data points.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
 Customer: SAMHEC
 Product: PN92074: JCF-316-S-0
 Description: DIP SÖLKEF CUNN IS GOLD

Spec: RH SID-12AA 2002
 Subgroup: 4
 File #: 280409
 Print Date: 24Jul92

Open circuit voltage: 10 millivolts

Test current: 100 milliamps

Units: milliohms
 Delta values

Temp °C	+22	+22	+22	+24
R.H. %	54	54	58	55
Date	14Jul92	14Jul92	14Jul92	24Jul92
Pos ID	INITIAL	DURA	I_SHOCK	HUMIDIT
2	4.6	+0.7	+2.7	+5.3
3	6.4	-0.2	+1.8	+2.8
4	6.3	+0.5	+0.7	+0.8
5	6.6	-0.2	-0.1	-0.3
6	6.3	+0.6	+0.7	+0.5
7	6.5	+0.1	+0.2	+0.1
10	4.6	+2.0	+2.7	+0.4
11	4.4	+1.2	+2.7	+1.5
12	3.6	+0.5	+0.3	+0.7
13	3.7	+0.6	+1.3	+1.6
14	3.9	+0.4	+1.3	+3.3
15	3.3	+0.5	+0.8	+3.3
HIGH	6.6	+2.0	+2.7	+5.3
LOW	3.3	-0.2	-0.1	-0.3
AVG	5.0	+0.6	+1.3	+1.7
STD DEV	1.3	0.6	1.0	1.7
OPENS	0	0	0	0
INITIALS	DAM	DAM	DAM	S-R

NOTES:

- 1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 82304
 Customer: SANTEC
 Product: PN92034: 1CP-216-3.0
 Description: DIP SOCKET CONN #6 GOLD

Spec: MIL-STD-1844 9002
 SubGroup: 4 - CYCLED
 File #: 230411
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms
 Delta values

Temp °C	+22	+22	+22	+23
R.H. %	54	54	58	55
Date	10Jul92	14Jul92	14Jul92	24Jul92
Pos ID	INITIAL	DURA	T-SHOCK	HUMID1
2	6.2	+0.7	+0.7	+1.1
3	4.4	+2.2	+2.5	+2.9
4	4.4	+2.4	+2.8	+2.1
5	4.3	+1.2	+2.3	+2.8
6	4.3	+2.3	+3.2	+2.9
7	4.4	+1.4	+2.6	+3.0
10	3.7	-0.1	+0.2	+1.8
11	3.7	-0.1	+1.4	+1.2
12	3.5	-0.0	+0.6	+0.3
13	4.8	-0.6	-0.0	+1.2
14	3.8	-0.1	-0.1	+0.3
15	3.7	+0.1	+1.9	+3.5
HIGH	6.2	+2.4	+3.2	+3.5
LOW	3.5	-0.6	-0.1	+0.3
AVG	4.3	+0.8	+1.5	+1.9
STD DEV	0.7	1.1	1.2	1.1
OPENS	0	0	0	0
INITIALS	DAM	DAM	DAM	S-R

NOTES:

1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page: 3

Project #: 92304
 Customer: SAMTEC
 Product: PN92034: ICF-S16-S-0
 Description: DIP SOCKET CONN#2 GOLD

Spec: NIT-116-1248-002
 SubGroup: 4 UNCYCLED
 File #: 230412
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 millamps

Units: milliohms
 Delta values

Temp °C	+22	+22	+23
R.H.%	54	58	55
Date	10Jul92	14Jul92	24Jul92
Pos ID	INITIAL	1.SHOCK	HUMIDITY
2	3.1	-0.1	+0.0
3	3.7	+1.6	+2.5
4	4.6	+2.7	+4.8
5	3.1	+0.4	+1.2
6	3.1	+0.1	+0.1
7	6.0	+0.1	-0.3
10	3.3	+0.2	+0.6
11	3.6	+1.6	+2.3
12	3.2	+0.6	+0.9
13	3.8	+0.5	+1.9
14	7.1	+0.3	+0.4
15	6.8	+0.1	+0.1
HIGH	7.1	+2.7	+4.8
LOW	3.1	-0.1	-0.3
AVG	4.3	+0.7	+1.2
STD DEV	1.5	0.8	1.5
OPENS	0	0	0
INITIALS	DAM	DAM	S-R

NOTES:

- 1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW LEVEL CONTACT RESISTANCE

Page: 1

Project #: 207006
Customer: SAMTEC
Product: PH92034: ICI-100-1-0
Description: QIP SOCKES CONN#8 GOLD

Spec: MH-100-1241-2002
Subgroup: 4 UNCYCLED
File #: 220415
Print Date: 14Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohm
Delta values

Temp °C	+22	+22	+22
R.H. %	54	58	55
Date	10Jul92	14Jul92	24Jul92
Pos ID	INITIAL	1.5HOCK	HUMIDI
2	4.4	-0.2	-0.3
3	3.7	+0.4	+0.3
4	4.6	-0.2	-0.1
5	4.2	-0.0	-0.0
6	5.3	+0.1	-0.5
7	5.4	+0.5	-0.3
10	5.2	+0.8	-0.2
11	3.7	+1.1	+2.7
12	3.6	+0.5	+1.6
13	3.8	+2.3	+2.5
14	3.6	+1.0	+2.9
15	3.6	+0.9	+2.8
HIGH	5.4	+2.3	+2.9
LOW	3.6	-0.2	-0.5
AVG	4.3	+0.6	+0.9
STD DEV	0.7	0.7	1.4
OPENS	0	0	0
INITIALS	DAM	DAM	S-R

NOTES:

1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW LEVEL CONTACT RESISTANCE

Page 1

Project #: 22304
 Customer: SARDEC
 Product: PRO7304 J17-S16-1-0
 Description: QIP SOCKET CONN# 5 f14

Spec: P11-S10-1344-3002
 SubGroup: 4 CYCLE9
 File #: 230410
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohm
 Delta values

Temp °C	+22	+27	+22	+27
R.H.%	54	54	58	55
Date	14Jul92	14Jul92	14Jul92	24Jul92
Pos ID	INITIAL	DURA	T.SHOCK	HUMID1
2	3.2	+0.7	+0.6	+2.0
3	3.3	-0.2	+0.0	+0.2
4	3.3	+0.2	+0.1	+0.3
5	3.5	+0.1	+0.0	+0.1
6	3.8	-0.5	+0.1	-0.1
7	3.6	-0.1	-0.2	-0.1
10	3.6	-0.6	-0.4	-0.3
11	3.5	-1.1	-0.7	-0.6
12	4.1	-0.4	-0.4	-0.4
13	3.1	-0.9	-0.7	-0.4
14	3.0	-0.1	+0.2	+0.3
15	3.2	-0.4	-0.3	+0.1
HIGH	4.1	+0.7	+0.6	+2.0
LOW	3.0	-1.1	-0.7	-0.6
AVG	3.4	-0.3	-0.1	+0.1
STD DEV	0.3	0.5	0.4	0.2
OPENS	0	0	0	0
INITIALS	DAM	DAM	DAM	S-R

NOTES:

1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW LEVEL CONDUCT RESISTANCE

Page 1

Project #: 2280a
 Customer: SANYO
 Product: PN9030a DT 116-1 0
 Description: DIP SOCKET CONN #s 11a

Spec: MIL-STD-1244 2002
 SubGroup: 4 CYCLE0
 File #: 230412
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamperes

Units: milliohms
 Delta values

Temp: °C	+12	+22	+22	+23
R.H. %	54	54	58	55
Date	10Jul92	14Jul92	14Jul92	24Jul92
Pos ID	INITIAL	DURA	1.5HOCK	HUMIDITY
2	5.9	-2.0	-1.9	-0.5
3	5.7	-2.2	-0.9	-1.0
4	5.8	-2.2	2.0	-1.8
5	3.7	+0.2	+0.5	+0.1
6	3.8	+0.0	+0.7	+0.1
7	3.7	+0.1	+0.0	+0.1
10	3.7	+0.6	-0.4	+2.3
11	3.6	+0.3	-0.6	+2.6
12	3.6	+0.3	+0.2	+0.3
13	3.4	+0.2	+0.1	+0.2
14	3.8	-0.3	-0.0	-0.0
15	3.7	+0.6	+0.1	+0.5
HIGH	5.9	+0.6	+0.7	+2.6
LOW	3.4	-2.2	-2.0	-1.8
AVG	4.2	-0.4	-0.3	+0.2
STD DEV	1.0	1.1	0.9	1.2
OPENS	0	0	0	0
INITIALS	DAN	DAM	DAM	S-R

NOTES:

- 1 An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
 Customer: SAMTEC
 Product: PN92304 ICF-316-I-0
 Description: DIP SOCKET COMN#7 TIN

Spec: MIL-STD-1344 3002
 SubGroup: 4 UNCYCLED
 File #: 230414
 Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms
 Delta values

Temp °C	+22	+22	+23
R.H. %	54	58	55
Date	10Jul92	14Jul92	24Jul92
Pos ID	INITIAL	T.SHOCK	HUMIDI
2	3.4	+0.2	+0.8
3	3.8	-0.2	-0.2
4	3.7	-0.1	+0.0
5	4.0	+1.7	+1.6
6	3.9	+2.1	+2.2
7	5.8	-0.0	+0.0
10	3.1	+0.6	+0.6
11	3.3	+0.3	+0.6
12	5.0	-1.1	-1.2
13	3.4	+0.3	+0.3
14	3.3	+0.0	+0.3
15	3.7	+0.0	+0.2
HIGH	5.8	+2.1	+2.2
LOW	3.1	-1.1	-1.2
AVG	3.9	+0.3	+0.4
STD DEV	0.8	0.9	0.9
OPENS	0	0	0
INITIALS	DAM	DAM	S-R

NOTES:

- 1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

LOW-LEVEL CONTACT RESISTANCE

Page 1

Project #: 92304
Customer: SAMTEC
Product: PN92304 ICF-316-T-0
Description: DIP SOCKET CONN#8 TIN

Spec: MIL-STD-1344 3002
SubGroup: 4 UNCYCLED
File #: 230416
Print Date: 24Jul92

Open circuit voltage: 20 millivolts

Test current: 100 milliamps

Units: milliohms
Delta values

Temp °C	+22	+22	+23
R.H. %	54	58	55
Date	10Jul92	14Jul92	24Jul92
Pos ID	INITIAL	T. SHOCK	HUMIDITY
2	3.9	-0.2	-0.0
3	3.1	+0.2	+0.5
4	3.1	+0.0	+0.1
5	3.5	-1.0	+0.1
6	3.6	-0.1	-0.4
7	3.2	+0.1	+0.2
10	4.0	+2.0	+2.1
11	3.8	+2.0	+2.2
12	3.7	-0.1	+0.1
13	3.6	-0.1	+0.1
14	3.8	+1.5	+2.0
15	3.7	-0.0	+0.3

HIGH	4.0	+2.0	+2.2
LOW	3.1	-1.0	-0.4
AVG	3.6	+0.4	+0.6
STD DEV	0.3	0.9	0.9
OPENS	0	0	0

INITIALS	DAM	DAM	S-R
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NOTES:

1 - An asterisk (*) indicates an open circuit or a value greater than 10 ohms.

