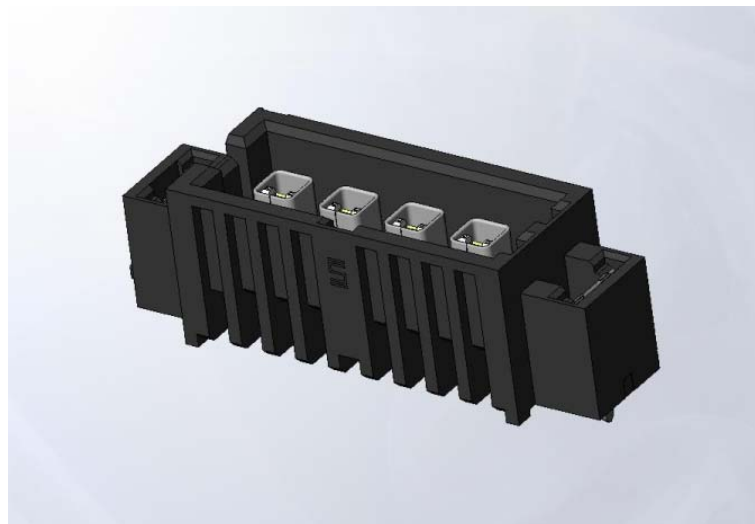




Project Number: Design Verification Test Report		Tracking Code: TC1018—3356_Report_Rev_2	
Requested by: Kevin Meredith		Date: 8/26/2010	Product Rev: 0
Part #: IJ5C-08-0300-S-D-NUS-1/ IP5-08-05.0-S-S-1-L		Lot #: na	Tech: Gary Lomax Eng: Eric Mings
Part description: IJ5C-08-0300-L-D-NUS-1			Qty to test:30
Test Start: 4/15/2010	Test Completed: 6/8/2010		



Design Verification Test Report

IJ5C (Sn Plated Shields)
IJ5C-08-0300-S-D-NUS-1/ IP5-08-05.0-S-S-1-L

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to ISO 10012-1 and ANSI/NCSL 2540-1, as applicable.

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SCOPE

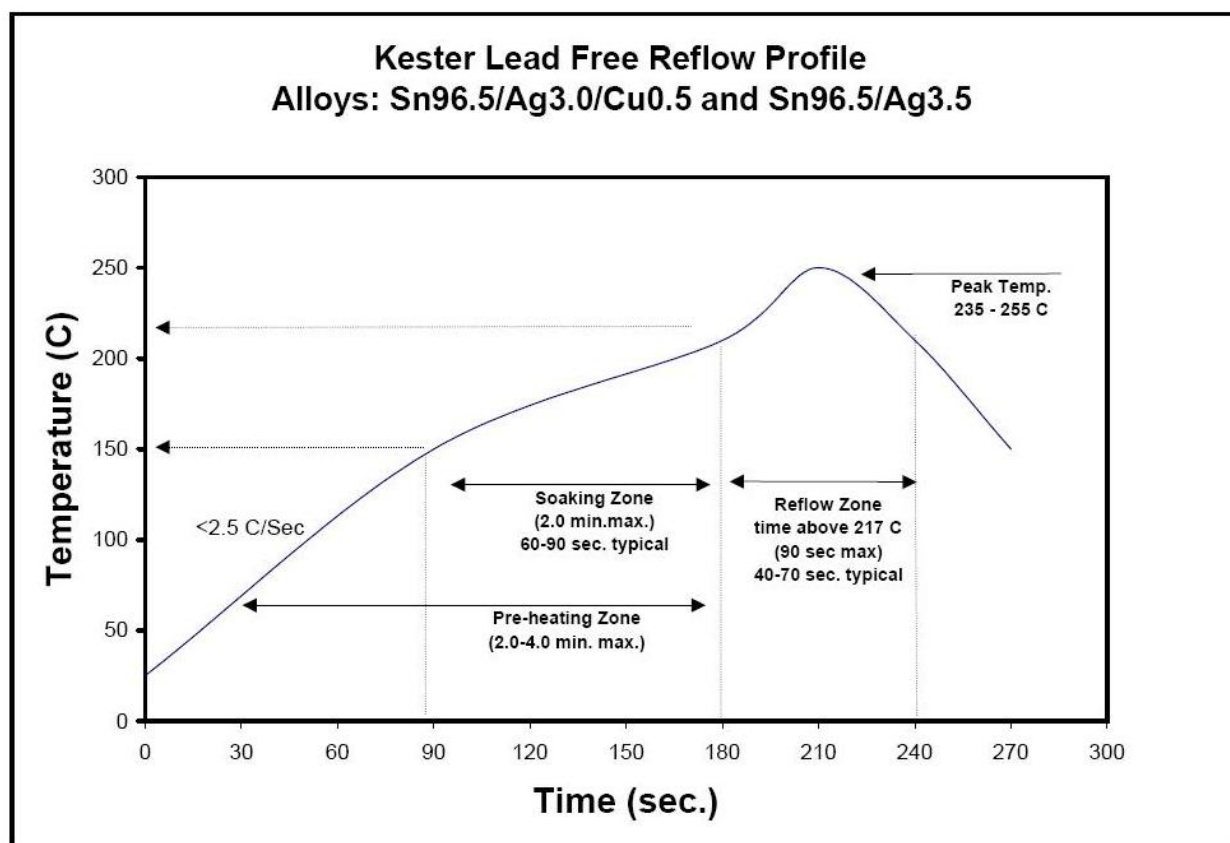
To perform the following tests: Design Verification Test ,See test plan TC1018—3356.

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to TLWI-0001.
- 4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
- 5) The automated procedure is used with aqueous compatible soldering materials.
- 6) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 7) Any additional preparation will be noted in the individual test sequences.
- 8) Solder Information: Lead free
- 9) Re-Flow Time/Temp: See accompanying profile.
- 10) Samtec Test PCBs used: PCB-101606-TST-01/ PCB-101667-TST-XX

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

FLOWCHARTS

Gas Tight

TEST STEP	GROUP A * 80 Points (Sig and Grd)
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36

LLCR = EIA-364-23, LLCR

use Keithley 580 in the dry circuit mode, 10 mA Max

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A *80 (Sig & Grd) Points 25 Cycles
01	LLCR-1
02	Data Review
03	25 Cycles
04	Clean compressed air
05	LLCR-2
06	Data Review
07	Thermal Age
08	LLCR-3
09	Data Review
10	Cyclic Humidity
11	LLCR-4

Thermal Aging = EIA-364-17, Test Condition 4, 105 deg C;

Time Condition 'B' (250 hours)

Humidity =EIA-364-31, Test Condition 'B' (240 Hours)

and Method III (+25° C to +65° C @ 90%RH/98% RH)

ambient pre-condition and delete steps 7a and 7b

LLCR = EIA-364-23, LLCR

use Keithley 580 in the dry circuit mode, 10 mA Max

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL:

- 1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors*.
- 2) Test Condition 4 at 105° C.
- 3) Test Time Condition B for 250 hours.
- 4) All test samples are pre-conditioned at ambient.
- 5) All test samples are exposed to environmental stressing in the mated condition.

HUMIDITY:

- 1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors*.
- 2) Test Condition B, 240 Hours.
- 3) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
- 4) All samples are pre-conditioned at ambient.
- 5) All test samples are exposed to environmental stressing in the mated condition.

LLCR:

- 1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
 - a. ≤ +5.0 mOhms: ----- Stable
 - b. +5.1 to +10.0 mOhms: ----- Minor
 - c. +10.1 to +15.0 mOhms: ----- Acceptable
 - d. +15.1 to +50.0 mOhms: ----- Marginal
 - e. +50.1 to +2000 mOhms: ----- Unstable
 - f. >+2000 mOhms:----- Open Failure

GAS TIGHT:

To provide method for evaluating the ability of the contacting surfaces in preventing penetration of harsh vapors which might lead to oxide formation that may degrade the electrical performance of the contact system.

- 1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
 - a. ≤ +5.0 mOhms: ----- Stable
 - b. +5.1 to +10.0 mOhms: ----- Minor
 - c. +10.1 to +15.0 mOhms: ----- Acceptable
 - d. +15.1 to +50.0 mOhms: ----- Marginal
 - e. +50.1 to +2000 mOhms: ----- Unstable
 - f. >+2000 mOhms:----- Open Failure
- 4) Procedure:
 - a. Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
 - b. Test Conditions:
 - i. Class II--- Mated pairs of contacts assembled to their plastic housings.
 - ii. Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
 - iii. The ratio of the volume of the test chamber to the surface area of the acid shall be 10:1.
 - iv. The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
 - v. Exposure time, 55 to 65 minutes.

- vi. The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
- vii. The samples shall be dried after exposure for a minimum of 1 hour.
- viii. Drying temperature 50^o C
- ix. The final LLCR shall be conducted within 1 hour after drying.

RESULTS**LLCR Durability (80 LLCR test points)****Ground pins:**

- **Initial** ----- 29.9 mOhms Max
- **Durability, 25 Cycles**
 - <= +5.0 mOhms ----- 80 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure
- **Thermal**
 - <= +5.0 mOhms ----- 80 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure
- **Humidity**
 - <= +5.0 mOhms ----- 80 Points ----- Stable
 - +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - >+2000 mOhms ----- 0 Points ----- Open Failure

Notes: The grounds are Sn plated shields.

Tracking Code: TC1018—3356 Report Rev 2	Part #: IJ5C-08-0300-S-D-NUS-1
Part description: IJ5C-08-0300-S-D-NUS-1	

RESULTS Continued

LLCR Gas Tight (80 LLCR test points)

- **Initial ----- 67.1 mOhms Max**
- **Gas-Tight**
 - **<= +5.0 mOhms ----- 78 Points ----- Stable**
 - **+5.1 to +10.0 mOhms ----- 2 Points ----- Minor**
 - **+10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable**
 - **+15.1 to +50.0 mOhms ----- 0 Points ----- Marginal**
 - **+50.1 to +2000 mOhms----- 0 Points ----- Unstable**
 - **>+2000 mOhms----- 0 Points ----- Open Failure**

Notes: The grounds are Sn plated shields.

DATA SUMMARIES**LLCR:**

- 1) A total of 80 points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms: ----- Stable
 - b. $+5.1$ to $+10.0$ mOhms: ----- Minor
 - c. $+10.1$ to $+15.0$ mOhms: ----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: ----- Marginal
 - e. $+50.1$ to $+2000$ mOhms ----- Unstable
 - f. $>+2000$ mOhms:----- Open Failure

Ground pins

Date	2010-5-1	2010-5-5	2010-5-24	2010-6-8
Room Temp				
C	24	24	24	25
RH	53%	40%	54%	44%
Name	Gary Lomax	Gary Lomax	Gary Lomax	Gary Lomax
mOhm values	Actual Initial	Delta 25 Cycles	Delta Thermal	Delta Humidity
Average	28.9	0.0	0.2	0.3
St. Dev.	0.2	0.1	0.2	0.4
Min	28.5	-0.2	0.0	-0.2
Max	29.9	0.2	1.1	2.1
Count	80	80	80	80

How many samples are being tested?

16

How many contacts are on each board?

5

	Stable	Minor	Acceptable	Marginal	Unstable	Open
25 Cycles	80	0	0	0	0	0
Thermal	80	0	0	0	0	0
Humidity	80	0	0	0	0	0

DATA SUMMARIES Continued**GAS TIGHT:**

- 1) A total of 80 points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
 - a. $\leq +5.0$ mOhms: ----- Stable
 - b. $+5.1$ to $+10.0$ mOhms: ----- Minor
 - c. $+10.1$ to $+15.0$ mOhms: ----- Acceptable
 - d. $+15.1$ to $+50.0$ mOhms: ----- Marginal
 - e. $+50.1$ to $+2000$ mOhms: ----- Unstable
 - f. $>+2000$ mOhms: ----- Open Failure

Date	2010-4-15	2010-4-16
Room Temp		
C	24	24
RH	38%	37%
Name	Gary Lomax	Gary Lomax
mOhm values	Actual Initial	Delta Gas Tight
Average	45.2	0.0
St. Dev.	15.3	1.6
Min	29.1	-6.2
Max	67.1	4.7
Count	80	80

How many samples are being tested?

8

How many contacts are on each board?

10

	Stable	Minor	Acceptable	Marginal	Unstable	Open
Gas Tight	78	2	0	0	0	0

DATA**LLCR:****Ground pins**

	mOhm values	Actual	Delta	Delta	Delta
Board	Position	Initial	25 Cycles	Thermal	Humidity
1	P1	29.0	-0.1	0.5	1.3
1	P3	28.8	0.0	1.1	1.8
1	P5	28.9	-0.1	0.3	0.4
1	P7	29.9	-0.1	0.4	0.2
1	P9	28.9	0.0	0.3	0.2
2	P1	28.5	-0.1	0.1	0.1
2	P3	28.7	-0.2	0.0	0.0
2	P5	29.6	-0.1	0.0	-0.1
2	P7	28.6	-0.1	0.2	0.0
2	P9	28.9	-0.2	0.0	-0.2
3	P1	28.9	0.0	0.2	1.1
3	P3	28.8	0.0	0.2	0.4
3	P5	28.9	0.0	0.4	0.5
3	P7	28.7	0.1	0.3	0.1
3	P9	29.3	0.1	0.4	0.3
4	P1	28.7	0.0	0.1	0.5
4	P3	28.8	-0.1	0.1	0.2
4	P5	28.7	-0.1	0.2	0.2
4	P7	28.7	-0.1	0.1	0.0
4	P9	28.8	-0.1	0.2	0.0
5	P1	29.1	-0.1	0.1	0.2
5	P3	28.8	-0.1	0.1	0.1
5	P5	28.7	-0.1	0.1	0.0
5	P7	28.7	-0.1	0.0	-0.1
5	P9	28.5	-0.1	0.2	0.0
6	P1	28.9	-0.1	0.1	0.1
6	P3	28.9	-0.1	0.2	0.1
6	P5	28.7	-0.1	0.1	0.1
6	P7	29.0	-0.1	0.1	-0.1
6	P9	28.8	0.0	0.3	0.2
7	P1	29.0	0.0	0.2	0.5
7	P3	28.8	-0.1	0.1	0.1
7	P5	28.7	-0.1	0.1	0.1
7	P7	28.9	-0.1	0.1	0.0
7	P9	28.9	-0.1	0.2	0.2
8	P1	29.4	-0.1	0.1	0.2
8	P3	29.3	-0.1	0.0	-0.1
8	P5	29.0	-0.1	0.1	0.0
8	P7	29.0	-0.1	0.1	-0.1
8	P9	29.0	-0.1	0.2	0.1
9	P1	28.8	0.1	0.4	2.1
9	P3	28.8	0.0	0.4	0.9
9	P5	29.0	0.0	0.3	0.4

9	P7	28.9	-0.1	0.1	0.1
9	P9	28.7	0.0	0.3	0.3
10	P1	28.9	0.1	0.3	0.4
10	P3	28.8	0.0	0.1	0.1
10	P5	28.7	0.0	0.2	0.1
10	P7	28.7	0.0	0.1	0.0
10	P9	28.7	0.1	0.3	0.1
11	P1	28.8	0.1	0.4	0.9
11	P3	28.9	0.0	0.2	0.6
11	P5	28.9	0.0	0.3	0.4
11	P7	28.8	0.0	0.3	0.2
11	P9	29.0	0.0	0.3	0.2
12	P1	28.8	0.0	0.1	0.1
12	P3	28.7	0.0	0.1	0.1
12	P5	28.8	0.0	0.1	0.1
12	P7	28.7	-0.1	0.1	-0.1
12	P9	29.1	0.0	0.2	0.2
13	P1	29.1	0.0	0.2	1.0
13	P3	29.0	-0.1	0.3	0.6
13	P5	28.9	-0.1	0.2	0.3
13	P7	28.9	0.0	0.3	0.3
13	P9	28.7	0.0	0.4	0.3
14	P1	28.9	0.1	0.5	1.2
14	P3	28.9	0.0	0.2	0.3
14	P5	28.7	0.0	0.1	0.0
14	P7	28.6	-0.1	0.1	0.0
14	P9	28.9	0.0	0.2	0.1
15	P1	29.0	0.0	0.0	0.1
15	P3	29.0	-0.1	0.1	0.2
15	P5	29.0	0.2	0.5	0.5
15	P7	29.1	-0.1	0.0	-0.1
15	P9	29.1	0.0	0.2	0.1
16	P1	29.0	0.0	0.2	0.6
16	P3	28.9	0.0	0.2	0.7
16	P5	28.8	0.0	0.1	0.0
16	P7	28.9	0.0	0.1	0.0
16	P9	29.1	0.0	0.1	0.1

DATA Continued**GAS TIGHT:**

	mOhm values	Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	31.8	0.2
1	P2	59.7	0.2
1	P3	29.6	0.2
1	P4	59.1	0.1
1	P5	29.6	0.2
1	P6	59.6	-0.2
1	P7	29.5	0.2
1	P8	60.2	-0.2
1	P9	29.6	0.2
1	P10	59.6	0.0
2	P1	30.0	0.2
2	P2	59.5	0.3
2	P3	29.1	0.2
2	P4	59.7	0.2
2	P5	29.7	0.2
2	P6	61.0	-0.4
2	P7	30.1	0.2
2	P8	59.9	0.0
2	P9	29.6	0.2
2	P10	60.3	0.3
3	P1	30.8	0.3
3	P2	60.9	0.5
3	P3	30.0	0.3
3	P4	59.6	0.6
3	P5	29.8	0.2
3	P6	58.7	0.4
3	P7	29.7	0.2
3	P8	60.2	0.9
3	P9	29.8	0.3
3	P10	59.7	0.6
4	P1	30.2	0.3
4	P2	61.4	0.1
4	P3	30.3	0.3
4	P4	60.8	0.2
4	P5	29.9	0.3
4	P6	60.1	0.3
4	P7	29.5	0.2
4	P8	59.4	0.1
4	P9	29.2	0.2
4	P10	60.1	0.4
5	P1	30.2	-4.7
5	P2	60.4	-6.2
5	P3	29.7	2.6

5	P4	61.7	4.7
5	P5	29.7	-0.2
5	P6	60.4	1.4
5	P7	29.7	-0.3
5	P8	59.8	0.2
5	P9	29.2	1.1
5	P10	58.9	1.6
6	P1	30.6	0.5
6	P2	60.6	-0.9
6	P3	30.3	0.3
6	P4	64.6	-4.5
6	P5	29.4	0.8
6	P6	59.8	1.1
6	P7	30.0	-0.6
6	P8	59.9	-0.8
6	P9	30.7	-0.7
6	P10	59.9	-0.9
7	P1	30.8	0.0
7	P2	59.4	1.3
7	P3	30.3	0.2
7	P4	59.8	4.2
7	P5	30.0	-0.4
7	P6	60.5	-0.4
7	P7	29.3	0.9
7	P8	58.2	1.9
7	P9	29.8	1.1
7	P10	58.9	1.0
8	P1	34.1	-3.6
8	P2	67.1	-6.2
8	P3	30.7	-0.9
8	P4	61.7	0.2
8	P5	29.4	0.5
8	P6	61.9	-1.4
8	P7	29.3	0.6
8	P8	60.0	-0.1
8	P9	30.3	-0.9
8	P10	60.6	-1.6

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** THC-01**Description:** Temperature/Humidity Chamber**Manufacturer:** Thermotron**Model:** SM-8-7800**Serial #:** 30676**Accuracy:** See Manual

... Last Cal: 02/16/2010, Next Cal: 08/16/2010

Equipment #: MO-01**Description:** Micro-Ohmmeter**Manufacturer:** Keithley**Model:** 580**Serial #:** 0772740**Accuracy:** See Manual

... Last Cal: 04/30/2010, Next Cal: 04/30/2011

Equipment #: OV-03**Description:** Cascade Tek Forced Air Oven**Manufacturer:** Cascade Tek**Model:** TFO-5**Serial #:** 0500100**Accuracy:** Temp. Stability: +/- .1C/C change in ambient

... Last Cal: 06/16/2010, Next Cal: 06/16/2011

Equipment #: MO-02**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0780546**Accuracy:** See Manual

... Last Cal: 06/16/09, Next Cal: 06/16/2010