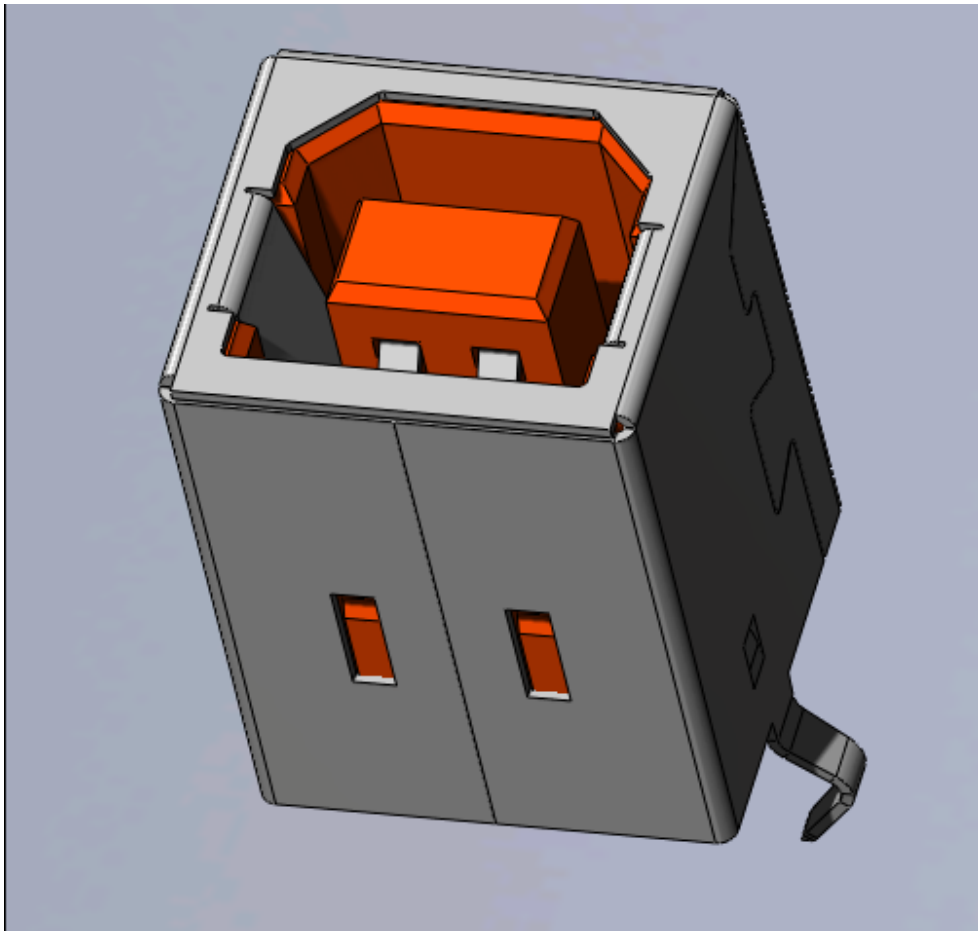




Project Number: N/A		Tracking Code: TC0943--2846--CH	
Requested by: Steven Xu		Date: 2/4/2010	Product Rev: 0
Part #: USBR-B-S-F-O-VT/USBC-AM-BM-B-B-S-1		Lot #: 1	Tech: Kason He Eng: Vico Zhao
Part description: USBR			Qty to test: 70
Test Start: 10-24-2009	Test Completed: 12-10-2009		



Design Verification Test Report

USBR

USBR-B-S-F-O-VT

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

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.

All contents contained herein are the property of Samtec. No portion of this report, in part or in full shall be reproduced without prior written approval of Samtec.

SCOPE

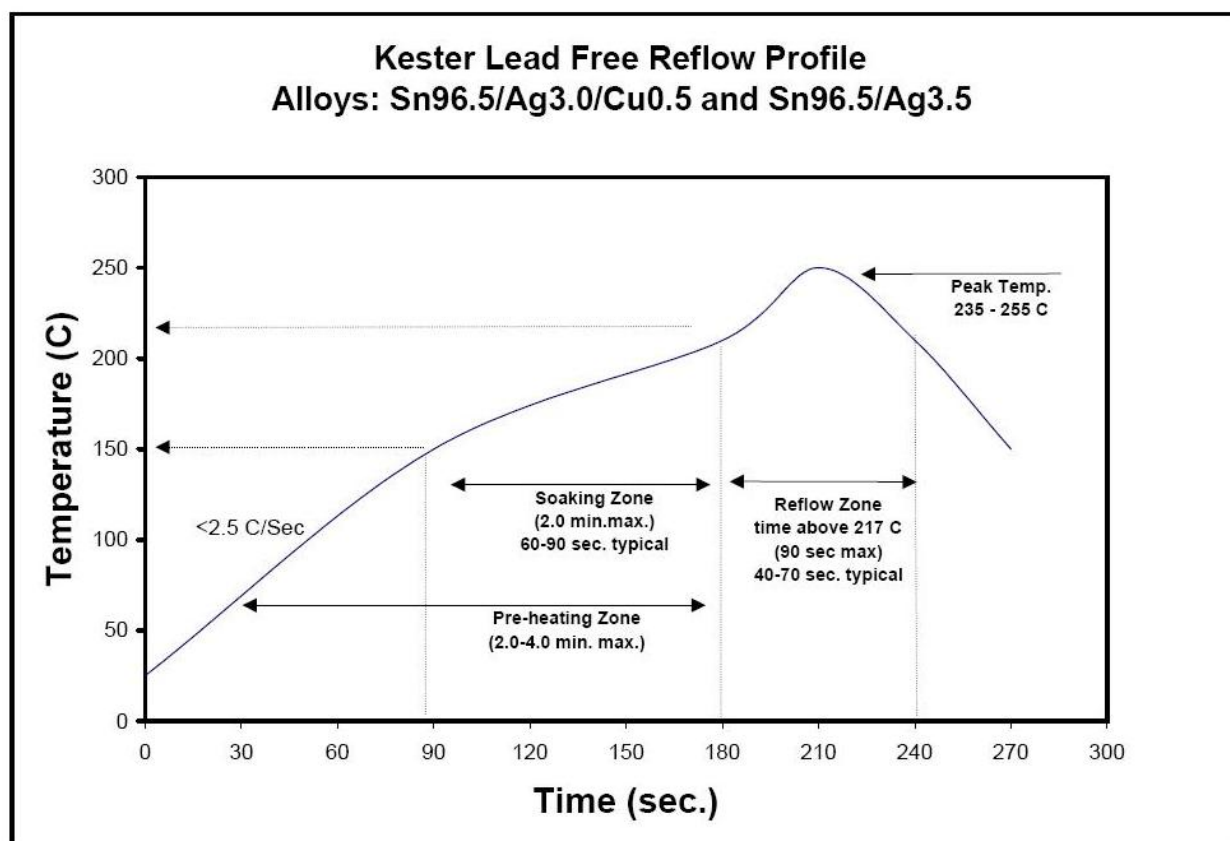
To perform the following tests: DVT , mating/unmating and LLCR

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-101828-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

FLOWCHARTS

Extended Life Test Plan (10-18-09)

USBR-B-S-F-O-VT

Plating Thickness

TEST STEP	GROUP A (FEMALE) 20 Points Minimum - 5 Sample
01	Measure & Verify Plating Thickness
02	Document Plating Thickness

TEST STEP	GROUP B (MALE) 20 Points Minimum - 5 Sample
01	Measure & Verify Plating Thickness
02	Document Plating Thickness

Durability

TEST STEP	GROUP A 40 Points - 10 Samples 250 Cycles
01	mating/unmating force measured
02	LLCR-1
03	cycle 250
04	LLCR-2
05	mating/unmating force measured

Mating/Un-Mating Forces = EIA-364-13

LLCR = EIA-364-23, LLCR

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

Durability

TEST STEP	GROUP A 40 Points - 10 Samples 500 Cycles
01	mating/unmating force measured
02	LLCR-1
03	cycle 500
04	LLCR-2
05	mating/unmating force measured

Mating/Un-Mating Forces = EIA-364-13

LLCR = EIA-364-23, LLCR

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

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

FLOWCHARTS

Extended Life Test Plan (10-18-09)

USBR-B-S-F-O-VT

Durability

TEST STEP	GROUP A 40 Points - 10 Samples 750 Cycles
01	mating/unmating force measured
02	LLCR-1
03	cycle 750
04	LLCR-2
05	mating/unmating force measured

Mating/Un-Mating Forces = EIA-364-13
 LLCR = EIA-364-23, LLCR
 use Keithley 580 in the dry circuit mode, 10 mA Max

Durability

TEST STEP	GROUP A 40 Points - 10 Samples 1000 Cycles
01	mating/unmating force measured
02	LLCR-1
03	cycle 1000
04	LLCR-2
05	mating/unmating force measured

Mating/Un-Mating Forces = EIA-364-13
 LLCR = EIA-364-23, LLCR
 use Keithley 580 in the dry circuit mode, 10 mA Max

Durability

TEST STEP	GROUP A 40 Points - 10 Samples 1250 Cycles
01	mating/unmating force measured
02	LLCR-1
03	cycle 1250
04	LLCR-2
05	mating/unmating force measured

Mating/Un-Mating Forces = EIA-364-13
 LLCR = EIA-364-23, LLCR
 use Keithley 580 in the dry circuit mode, 10 mA Max

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

FLOWCHARTS

Extended Life Test Plan (10-18-09)

USBR-B-S-F-O-VT

Durability

TEST STEP	GROUP A 40 Points - 10 Samples 1500 Cycles
01	mating/unmating force measured
02	LLCR-1
03	cycle 15 00
04	LLCR-2
05	mating/unmating force measured

Mating/Un-Mating Forces = EIA-364-13
 LLCR = EIA-364-23, LLCR
 use Keithley 580 in the dry circuit mode, 10 mA Max

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

MATING/UNMATING:

- 1) Reference document: EIA-364-13, *Mating and Unmating Forces Test Procedure for Electrical Connectors*.
- 2) The full insertion position was to within 0.003” to 0.004” of the plug bottoming out in the receptacle to prevent damage to the system under test.
- 3) One of the mating parts is secured to a floating X-Y table to prevent damage during cycling.

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. $\leq +5.0$ 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

RESULTS**Plating Thickness****Au**

- **Min** ----- 3.14μ"
- **Max** ----- 4.28μ"

Ni

- **Min** ----- 102.66μ"
- **Max** ----- 127.39μ"

Mating – Unmating Forces**Seq1 250 cycles****• Initial****o Mating**

- **Min** ----- 4.76 Lbs
- **Max** ----- 6.90 Lbs

o Unmating

- **Min** ----- 7.06 Lbs
- **Max** ----- 8.90 Lbs

• After 250 Cycles**o Mating**

- **Min** ----- 5.82 Lbs
- **Max** ----- 7.80 Lbs

o Unmating

- **Min** ----- 6.04 Lbs
- **Max** ----- 7.80 Lbs

Seq2 500 cycles**• Initial****o Mating**

- **Min** ----- 5.05 Lbs
- **Max** ----- 6.30 Lbs

o Unmating

- **Min** ----- 6.77 Lbs
- **Max** ----- 8.40 Lbs

• After 500 Cycles**o Mating**

- **Min** ----- 4.17 Lbs
- **Max** ----- 6.10 Lbs

o Unmating

- **Min** ----- 4.17 Lbs
- **Max** ----- 6.70 Lbs

RESULTS**Seq3 750 cycles**

- **Initial**
 - **Mating**
 - **Min** ----- 5.23 Lbs
 - **Max** ----- 6.20 Lbs
 - **Unmating**
 - **Min** ----- 6.70 Lbs
 - **Max** ----- 8.80 Lbs
- **After 750 Cycles**
 - **Mating**
 - **Min** ----- 3.95 Lbs
 - **Max** ----- 4.40 Lbs
 - **Unmating**
 - **Min** ----- 4.08 Lbs
 - **Max** ----- 4.70 Lbs

Seq4 1000 cycles

- **Initial**
 - **Mating**
 - **Min** ----- 6.02 Lbs
 - **Max** ----- 6.30 Lbs
 - **Unmating**
 - **Min** ----- 7.25 Lbs
 - **Max** ----- 8.40 Lbs
- **After 1000 Cycles**
 - **Mating**
 - **Min** ----- 3.73 Lbs
 - **Max** ----- 4.20 Lbs
 - **Unmating**
 - **Min** ----- 3.77 Lbs
 - **Max** ----- 4.10 Lbs

Seq5 1250 cycles

- **Initial**
 - **Mating**
 - **Min** ----- 6.00 Lbs
 - **Max** ----- 6.30 Lbs
 - **Unmating**
 - **Min** ----- 7.65 Lbs
 - **Max** ----- 8.50 Lbs
- **After 1250 Cycles**
 - **Mating**
 - **Min** ----- 3.70 Lbs
 - **Max** ----- 4.10 Lbs
 - **Unmating**
 - **Min** ----- 3.64 Lbs
 - **Max** ----- 4.00 Lbs

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

RESULTS

Seq6 1500 cycles

- Initial
 - Mating
 - Min ----- 6.04 Lbs
 - Max ----- 6.40 Lbs
 - Unmating
 - Min ----- 7.59 Lbs
 - Max ----- 8.40 Lbs
- After 1500 Cycles
 - Mating
 - Min ----- 3.42 Lbs
 - Max ----- 3.70 Lbs
 - Unmating
 - Min ----- 3.40 Lbs
 - Max ----- 3.70 Lbs

LLCR (60 LLCR test points)

Seq1 250 cycles

Contact

- Initial ----- 20.0mOhms Max
- Durability, 250 Cycles
 - <= +5.0 mOhms ----- 40 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

Shell

- Initial ----- 4.9mOhms Max
- Durability, 250 Cycles
 - <= +5.0 mOhms ----- 20 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

Seq2 500 cycles

Contact

- Initial ----- 19.4mOhms Max
- Durability, 500 Cycles
 - <= +5.0 mOhms ----- 40 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

Shell

- Initial ----- 4.8mOhms Max
- Durability, 500 Cycles
 - <= +5.0 mOhms ----- 20 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

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

RESULTS

Seq3 750 cycles

Contact

- Initial ----- 19.6mOhms Max
- Durability, 750 Cycles
 - o <= +5.0 mOhms ----- 40 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Shell

- Initial ----- 4.7mOhms Max
- Durability, 750 Cycles
 - o <= +5.0 mOhms ----- 20 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Seq4 1000 cycles

Contact

- Initial ----- 19.4mOhms Max
- Durability, 1000 Cycles
 - o <= +5.0 mOhms ----- 40 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Shell

- Initial ----- 5.3mOhms Max
- Durability, 1000 Cycles
 - o <= +5.0 mOhms ----- 20 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

RESULTS

Seq5 1250 cycles

Contact

- Initial ----- 19.5mOhms Max
- Durability, 1250 Cycles
 - o <= +5.0 mOhms ----- 40 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Shell

- Initial ----- 4.9mOhms Max
- Durability, 1250 Cycles
 - o <= +5.0 mOhms ----- 20 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Seq6 1500 cycles

Contact

- Initial ----- 19.5mOhms Max
- Durability, 1500 Cycles
 - o <= +5.0 mOhms ----- 40 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

Shell

- Initial ----- 5.9mOhms Max
- Durability, 1500 Cycles
 - o <= +5.0 mOhms ----- 20 Points ----- Stable
 - o +5.1 to +10.0 mOhms ----- 0 Points ----- Minor
 - o +10.1 to +15.0 mOhms ----- 0 Points ----- Acceptable
 - o +15.1 to +50.0 mOhms ----- 0 Points ----- Marginal
 - o +50.1 to +2000 mOhms ----- 0 Points ----- Unstable
 - o >+2000 mOhms ----- 0 Points ----- Open Failure

DATA SUMMARIES**PLATING THICKNESS**

Min	3.14	102.66
Max	4.28	127.39
Average	3.51	110.17

MATING/UNMATING:**Seq1 250 cycles**

	Initial				After 250 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	76.2	4.76	112.9	7.06	93.1	5.82	96.7	6.04
Maximum	111.1	6.9	142.2	8.9	124.5	7.8	125.6	7.8
Average	89.2	5.6	129.7	8.1	103.1	6.4	112.0	7.0

Seq2 500 cycles

	Initial				After 500 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	80.8	5.05	108.3	6.77	66.7	4.17	66.7	4.17
Maximum	100.9	6.3	134.4	8.4	97.7	6.1	107.6	6.7
Average	91.4	5.7	121.3	7.6	80.3	5.0	84.2	5.3

Seq3 750 cycles

	Initial				After 750 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	83.6	5.23	107.3	6.70	63.2	3.95	65.3	4.08
Maximum	98.8	6.2	140.8	8.8	70.2	4.4	75.5	4.7
Average	90.1	5.6	122.3	7.6	66.5	4.2	68.8	4.3

Seq4 1000 cycles

	Initial				After 1000 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	96.3	6.02	116.1	7.25	59.6	3.73	60.3	3.77
Maximum	100.2	6.3	135.1	8.4	67.4	4.2	65.6	4.1
Average	98.2	6.1	126.1	7.9	64.3	4.0	62.9	3.9

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

Seq5 1250 cycles

	Initial				After 1250 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Kgf)	Force (Oz)	Force (Kgf)	Force (Oz)	Force (Kgf)	Force (Oz)	Force (Kgf)
Minimum	96.0	6.00	122.4	7.65	59.3	3.70	58.2	3.64
Maximum	100.2	6.3	136.5	8.5	64.9	4.1	64.6	4.0
Average	98.1	6.1	127.5	8.0	61.9	3.9	61.9	3.9

Seq6 1500 cycles

	Initial				After 1500 Cycles			
	Mating		Unmating		Mating		Unmating	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	96.7	6.04	121.4	7.59	54.7	3.42	54.3	3.40
Maximum	101.6	6.4	135.1	8.4	59.3	3.7	58.9	3.7
Average	98.6	6.2	129.2	8.1	57.5	3.6	56.2	3.5

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

LLCR:

- 1) A total of **60** 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

Seq1 250 cycles

Contact

Date	Nov. 24 2009	Dec. 01 2009
Room Temp C	23	22
RH	44%	47%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 250 Cycles
Average	17.0	-0.2
St. Dev.	2.5	0.4
Min	14.1	-1.2
Max	20.0	0.5
Count	40	40

	Stable	Minor	Acceptable	Marginal	Unstable	Open
250 Cycles	40	0	0	0	0	0

Shell

Date	Nov. 24 2009	Dec. 01 2009
Room Temp C	23	22
RH	44%	47%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 250 Cycles
Average	4.5	3.3
St. Dev.	0.2	0.6
Min	4.1	2.5
Max	4.9	4.3
Count	20	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
250 Cycles	20	0	0	0	0	0

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

Seq2 500 cycles

Contact

Date	Nov. 24 2009	Dec. 02 2009
Room Temp C	23	21
RH	44%	50%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 500 Cycles
Average	16.7	0.0
St. Dev.	2.5	0.3
Min	13.7	-0.8
Max	19.4	0.5
Count	40	40

	Stable	Minor	Acceptable	Marginal	Unstable	Open
500 Cycles	40	0	0	0	0	0

Shell

Date	Nov. 24 2009	Dec. 02 2009
Room Temp C	23	21
RH	44%	50%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 500 Cycles
Average	4.5	3.3
St. Dev.	0.2	0.9
Min	4.2	1.4
Max	4.8	4.8
Count	20	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
500 Cycles	20	0	0	0	0	0

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

Seq3 750 cycles

Contact

Date	Nov. 24 2009	Dec. 07 2009
Room Temp C	23	22
RH	44%	49%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 750 Cycles
Average	16.8	0.2
St. Dev.	2.5	0.4
Min	13.9	-0.6
Max	19.6	1.1
Count	40	40

	Stable	Minor	Acceptable	Marginal	Unstable	Open
750 Cycles	40	0	0	0	0	0

Shell

Date	Nov. 24 2009	Dec. 07 2009
Room Temp C	23	22
RH	44%	49%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 750 Cycles
Average	4.4	-0.2
St. Dev.	0.2	0.7
Min	4.0	-1.0
Max	4.7	1.5
Count	20	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
750 Cycles	20	0	0	0	0	0

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

Seq4

Contact

Date	Nov. 24 2009	Dec. 09 2009
Room Temp C	24	20
RH	44%	59%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 1000 Cycles
Average	16.7	0.5
St. Dev.	2.4	0.6
Min	13.9	-0.8
Max	19.4	3.1
Count	40	40

	Stable	Minor	Acceptable	Marginal	Unstable	Open
1000 Cycles	40	0	0	0	0	0

Shell

Date	Nov. 24 2009	Dec. 09 2009
Room Temp C	24	20
RH	44%	59%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 1000 Cycles
Average	4.3	-0.4
St. Dev.	0.3	0.7
Min	3.8	-1.6
Max	5.3	2.0
Count	20	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
1000 Cycles	20	0	0	0	0	0

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

Seq5

Contact

Date	Nov. 24 2009	Dec. 10 2009
Room Temp C	24	21
RH	44%	63%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 1250 Cycles
Average	16.8	0.2
St. Dev.	2.5	0.3
Min	13.7	-0.4
Max	19.5	0.9
Count	40	40

	Stable	Minor	Acceptable	Marginal	Unstable	Open
1250 Cycles	40	0	0	0	0	0

Shell

Date	Nov. 24 2009	Dec. 10 2009
Room Temp C	24	21
RH	44%	63%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 1250 Cycles
Average	4.4	-0.5
St. Dev.	0.4	0.4
Min	3.8	-1.3
Max	4.9	0.3
Count	20	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
1250 Cycles	20	0	0	0	0	0

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

DATA SUMMARIES

Seq6

Contact

Date	Nov. 24 2009	Dec. 10 2009
Room Temp C	24	20
RH	44%	58%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 1500 Cycles
Average	16.8	0.2
St. Dev.	2.5	0.4
Min	14.1	-0.6
Max	19.5	1.0
Count	40	40

	Stable	Minor	Acceptable	Marginal	Unstable	Open
1500 Cycles	40	0	0	0	0	0

Shell

Date	Nov. 24 2009	Dec. 10 2009
Room Temp C	24	20
RH	44%	58%
Name	Kason He	Kason He
mOhm values	Actual Initial	Delta 1500 Cycles
Average	4.8	-0.9
St. Dev.	0.6	0.7
Min	4.1	-2.3
Max	5.9	0.0
Count	20	20

	Stable	Minor	Acceptable	Marginal	Unstable	Open
1500 Cycles	20	0	0	0	0	0

DATA**PLATING THICKNESS:**

<i>UNIT: μ"</i>		
Pin#	Au	Ni
1	3.28	108.64
2	4.28	116.37
3	3.55	109.64
4	3.69	110.57
5	4.27	127.39
6	3.61	118.62
7	3.19	107.59
8	3.44	102.66
9	3.76	107.94
10	3.29	110.63
11	3.18	106.54
12	3.67	104.93
13	3.55	108.64
14	3.61	113.49
15	3.26	105.73
16	3.14	106.49
17	3.28	113.49
18	3.43	109.62
19	3.56	107.57
20	3.15	106.94
Min	3.14	102.66
Max	4.28	127.39
Average	3.51	110.17

MATING/UNMATING:

Seq 1	Initial		After 250 Cycles	
Sample#	Mating	Unmating	Mating	Unmating
1	5.62	8.00	6.15	6.22
2	5.29	7.65	6.55	6.75
3	6.04	8.47	7.78	7.81
4	4.76	7.06	5.82	6.66
5	5.58	8.58	5.98	7.85
6	4.85	8.11	6.50	7.72
7	6.95	8.58	6.99	6.04
8	5.69	8.89	6.42	6.88
9	5.27	7.87	6.33	6.99
10	5.67	7.87	5.93	7.10

Seq2	Initial		After 500 Cycles	
<u>Sample#</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	5.49	7.03	5.18	4.61
2	5.69	7.36	5.03	6.11
3	5.93	7.45	4.41	4.48
4	5.49	8.33	5.42	6.04
5	5.89	7.30	5.16	4.98
6	5.05	7.43	4.87	5.42
7	6.31	6.77	5.31	5.78
8	5.98	8.40	4.52	4.32
9	5.40	7.59	4.17	4.17
10	5.91	8.11	6.11	6.73

Seq3	Initial		After 750 Cycles	
<u>Sample#</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	6.17	8.14	3.99	4.08
2	6.09	7.61	3.95	4.23
3	5.62	8.03	4.08	4.10
4	5.64	8.80	4.39	4.26
5	5.36	6.70	4.06	4.54
6	5.69	7.54	4.32	4.17
7	5.47	7.03	4.23	4.12
8	5.29	6.97	4.17	4.23
9	5.78	7.17	4.34	4.52
10	5.23	8.47	4.06	4.72

Seq4	Initial		After 1000 Cycles	
<u>Sample#</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	6.26	7.92	4.17	4.01
2	6.15	7.61	3.99	3.88
3	6.17	8.09	3.95	3.77
4	6.06	8.45	4.01	4.10
5	6.11	7.65	3.73	3.79
6	6.06	7.83	4.15	3.90
7	6.02	8.03	3.88	3.81
8	6.22	7.25	4.08	3.99
9	6.09	7.83	4.21	4.08
10	6.24	8.18	4.04	3.95

Seq5	Initial		After 1250 Cycles	
<u>Sample#</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	6.06	8.05	3.79	3.90
2	6.26	7.70	4.06	3.81
3	6.11	8.53	3.86	3.86
4	6.00	8.14	3.70	4.04
5	6.15	7.89	3.84	3.88
6	6.24	7.65	3.77	3.64
7	6.17	8.05	3.92	3.95
8	6.04	8.16	4.01	3.79
9	6.20	7.67	3.90	3.84
10	6.11	7.85	3.81	3.99

Seq6	Initial		After 1500 Cycles	
<u>Sample#</u>	<u>Mating</u>	<u>Unmating</u>	<u>Mating</u>	<u>Unmating</u>
1	6.24	7.92	3.70	3.55
2	6.13	7.98	3.48	3.44
3	6.06	7.59	3.53	3.59
4	6.28	8.18	3.59	3.46
5	6.15	7.83	3.70	3.59
6	6.11	8.45	3.70	3.46
7	6.04	8.05	3.66	3.68
8	6.20	8.09	3.64	3.51
9	6.09	8.27	3.51	3.40
10	6.35	8.40	3.42	3.46

LLCR:**Seq1 Contact**

	mOhm values	Actual	Delta
Board	Position	Initial	250 Cycles
1	P1	14.1	0.2
1	P2	19.1	0.5
1	P3	19.4	-0.3
1	P4	14.6	-0.5
2	P1	14.5	0.3
2	P2	19.2	0.0
2	P3	19.3	0.0
2	P4	14.4	-0.3
3	P1	14.3	-0.3
3	P2	19.5	-0.3
3	P3	19.4	-0.1
3	P4	14.7	-0.5

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

4	P1	14.4	-0.1
4	P2	19.3	0.1
4	P3	19.5	0.0
4	P4	14.5	-0.3
5	P1	14.7	0.0
5	P2	19.4	-0.1
5	P3	19.2	0.0
5	P4	14.7	-0.7
6	P1	14.4	-0.3
6	P2	19.5	-0.1
6	P3	19.4	-0.2
6	P4	14.6	-0.5
7	P1	14.5	-0.2
7	P2	19.3	-0.1
7	P3	19.1	0.1
7	P4	14.1	0.1
8	P1	14.7	-0.3
8	P2	19.3	-0.3
8	P3	19.4	-0.1
8	P4	14.5	-0.4
9	P1	14.8	-0.7
9	P2	19.2	-0.2
9	P3	19.3	0.0
9	P4	14.6	-0.2
10	P1	15.1	-0.9
10	P2	20.0	-1.2
10	P3	20.0	-0.6
10	P4	15.3	-1.1

Shell

	mOhm values	Actual	Delta
Board	Position	Initial	250 Cycles
1	P1	4.5	3.1
1	P2	4.5	2.8
2	P1	4.8	3.1
2	P2	4.9	3.1
3	P1	4.6	3.8
3	P2	4.6	3.6
4	P1	4.7	3.2
4	P2	4.4	3.5
5	P1	4.1	3.9
5	P2	4.3	3.3
6	P1	4.5	4.0
6	P2	4.5	3.9
7	P1	4.8	4.3
7	P2	4.5	3.9
8	P1	4.6	2.5
8	P2	4.4	2.5

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

9	P1	4.2	2.7
9	P2	4.2	2.5
10	P1	4.7	2.8
10	P2	4.2	3.1

Seq2 Contact

	mOhm values	Actual	Delta
Board	Position	Initial	500 Cycles
1	P1	13.7	0.3
1	P2	18.9	0.2
1	P3	19.2	-0.2
1	P4	14.2	0.4
2	P1	14.5	-0.3
2	P2	19.1	0.0
2	P3	19.2	-0.3
2	P4	14.1	-0.1
3	P1	14.0	0.0
3	P2	19.3	-0.1
3	P3	19.1	0.1
3	P4	14.7	-0.6
4	P1	14.3	-0.3
4	P2	19.1	0.1
4	P3	19.1	0.1
4	P4	14.3	0.3
5	P1	14.4	0.2
5	P2	19.0	0.2
5	P3	19.0	0.3
5	P4	14.5	-0.1
6	P1	14.3	0.1
6	P2	19.3	0.0
6	P3	19.3	0.5
6	P4	14.2	0.2
7	P1	14.1	0.1
7	P2	19.2	-0.3
7	P3	19.2	-0.5
7	P4	14.5	-0.3
8	P1	14.2	-0.2
8	P2	19.3	0.2
8	P3	19.1	0.2
8	P4	14.6	-0.8
9	P1	14.2	0.2
9	P2	19.4	0.2
9	P3	19.3	0.0
9	P4	14.6	-0.2
10	P1	14.2	-0.1
10	P2	19.2	-0.2
10	P3	19.3	-0.3
10	P4	14.2	0.1

Shell

	mOhm values	Actual	Delta
Board	Position	Initial	500 Cycles
1	P1	4.8	3.4
1	P2	4.6	2.5
2	P1	4.5	4.0
2	P2	4.7	3.6
3	P1	4.5	3.5
3	P2	4.5	3.5
4	P1	4.7	2.3
4	P2	4.7	2.3
5	P1	4.3	3.7
5	P2	4.4	2.5
6	P1	4.6	1.4
6	P2	4.4	1.7
7	P1	4.4	4.6
7	P2	4.7	4.1
8	P1	4.4	3.7
8	P2	4.2	3.6
9	P1	4.5	3.6
9	P2	4.4	3.4
10	P1	4.6	4.6
10	P2	4.2	4.8

Seq3 Contact

	mOhm values	Actual	Delta
Board	Position	Initial	750 Cycles
1	P1	13.9	0.2
1	P2	19.3	-0.1
1	P3	19.1	-0.2
1	P4	14.3	-0.1
2	P1	14.3	0.1
2	P2	19.2	0.1
2	P3	19.2	-0.4
2	P4	14.2	-0.3
3	P1	14.3	-0.4
3	P2	19.1	0.0
3	P3	19.2	0.1
3	P4	14.1	0.3
4	P1	14.2	-0.1
4	P2	19.2	0.1
4	P3	18.9	0.4
4	P4	14.1	0.0
5	P1	14.2	1.0
5	P2	19.4	0.2
5	P3	19.6	0.4
5	P4	14.4	0.6
6	P1	14.4	-0.1

6	P2	19.2	0.1
6	P3	19.4	0.5
6	P4	14.4	0.1
7	P1	14.2	0.4
7	P2	19.3	0.6
7	P3	19.4	1.1
7	P4	14.6	0.8
8	P1	14.8	-0.6
8	P2	19.2	0.4
8	P3	19.2	0.5
8	P4	14.4	0.4
9	P1	14.5	0.2
9	P2	19.1	0.8
9	P3	19.4	0.1
9	P4	14.6	0.1
10	P1	14.7	-0.5
10	P2	19.3	0.0
10	P3	19.5	-0.3
10	P4	14.7	-0.2

Shell

	mOhm values	Actual	Delta
Board	Position	Initial	750 Cycles
1	P1	4.1	0.2
1	P2	4.2	0.3
2	P1	4.3	0.9
2	P2	4.4	0.4
3	P1	4.3	1.5
3	P2	4.3	0.1
4	P1	4.5	-0.1
4	P2	4.0	0.0
5	P1	4.6	-0.9
5	P2	4.7	-0.9
6	P1	4.3	-0.6
6	P2	4.6	-0.6
7	P1	4.5	-1.0
7	P2	4.5	-0.8
8	P1	4.3	0.0
8	P2	4.3	-0.2
9	P1	4.4	-0.6
9	P2	4.7	-1.0
10	P1	4.1	-0.2
10	P2	4.3	-0.7

Seq4 Contact

	mOhm values	Actual	Delta
Board	Position	Initial	1000 Cycles
1	P1	14.1	0.0
1	P2	19.1	0.4
1	P3	19.1	0.2
1	P4	14.4	-0.2
2	P1	14.0	0.4
2	P2	19.3	-0.1
2	P3	19.0	0.2
2	P4	14.5	-0.3
3	P1	14.2	0.1
3	P2	19.0	0.7
3	P3	19.2	0.7
3	P4	14.6	0.1
4	P1	14.2	0.4
4	P2	19.1	0.6
4	P3	19.1	0.7
4	P4	14.4	0.4
5	P1	14.2	0.5
5	P2	19.3	1.0
5	P3	19.0	1.6
5	P4	14.3	1.1
6	P1	14.7	-0.8
6	P2	18.4	1.0
6	P3	18.4	3.1
6	P4	15.6	-0.5
7	P1	13.9	0.6
7	P2	19.4	0.3
7	P3	19.2	0.6
7	P4	14.6	0.4
8	P1	14.5	0.0
8	P2	19.0	0.8
8	P3	19.0	1.0
8	P4	14.5	0.2
9	P1	13.9	1.1
9	P2	19.2	1.0
9	P3	19.1	0.9
9	P4	14.6	0.3
10	P1	14.2	0.1
10	P2	19.2	0.2
10	P3	19.2	1.0
10	P4	14.3	0.5

Shell

	mOhm values	Actual	Delta
Board	Position	Initial	1000 Cycles
1	P1	4.1	2.0
1	P2	4.5	0.3
2	P1	4.3	-0.5
2	P2	4.3	-0.5
3	P1	4.1	-0.2
3	P2	4.1	-0.4
4	P1	4.2	-0.6
4	P2	4.0	-0.3
5	P1	4.4	-0.6
5	P2	4.3	-0.8
6	P1	5.3	-1.6
6	P2	5.0	-1.3
7	P1	3.8	-0.1
7	P2	4.3	-0.3
8	P1	4.1	-0.2
8	P2	4.4	-0.7
9	P1	4.1	-0.5
9	P2	4.3	-0.8
10	P1	4.6	-0.9
10	P2	4.2	-0.5

Seq5 Contact

	mOhm values	Actual	Delta
Board	Position	Initial	1250 Cycles
1	P1	13.7	0.8
1	P2	19.3	0.2
1	P3	19.2	0.3
1	P4	14.3	0.4
2	P1	14.0	0.3
2	P2	18.6	0.8
2	P3	19.1	0.5
2	P4	14.4	-0.1
3	P1	14.2	0.2
3	P2	18.6	0.9
3	P3	19.1	0.9
3	P4	14.3	0.4
4	P1	14.5	0.0
4	P2	19.5	-0.1
4	P3	19.0	0.7
4	P4	14.4	0.3
5	P1	14.5	0.0
5	P2	19.2	0.7

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

5	P3	19.3	0.3
5	P4	14.4	0.0
6	P1	14.3	0.3
6	P2	19.5	-0.3
6	P3	19.4	0.6
6	P4	14.7	-0.4
7	P1	14.4	-0.1
7	P2	19.3	0.0
7	P3	19.5	0.0
7	P4	14.5	0.1
8	P1	14.7	-0.1
8	P2	19.4	0.4
8	P3	19.2	0.5
8	P4	14.7	-0.4
9	P1	14.4	0.3
9	P2	19.5	-0.1
9	P3	19.4	-0.1
9	P4	14.6	0.2
10	P1	14.5	-0.1
10	P2	19.3	-0.1
10	P3	19.1	0.4
10	P4	14.1	0.3

Shell

	mOhm values	Actual	Delta
Board	Position	Initial	1250 Cycles
1	P1	4.3	-0.6
1	P2	4.3	-0.5
2	P1	3.9	0.1
2	P2	4.3	-0.5
3	P1	4.1	-0.5
3	P2	3.8	-0.3
4	P1	4.1	-0.2
4	P2	4.1	0.1
5	P1	4.6	-0.5
5	P2	4.8	-0.8
6	P1	4.0	0.3
6	P2	4.6	-0.6
7	P1	4.5	0.0
7	P2	4.7	-0.5
8	P1	4.9	-1.3
8	P2	4.5	-0.6
9	P1	4.9	-0.8
9	P2	4.5	-0.3
10	P1	4.9	-1.2
10	P2	4.9	-1.2

**Seq6
Contact**

	mOhm values	Actual	Delta
Board	Position	Initial	1500 Cycles
1	P1	14.6	-0.6
1	P2	19.0	0.3
1	P3	19.5	0.5
1	P4	14.2	0.4
2	P1	14.4	0.0
2	P2	19.1	0.3
2	P3	19.5	-0.4
2	P4	14.6	-0.3
3	P1	14.3	0.0
3	P2	19.4	0.1
3	P3	19.5	-0.3
3	P4	14.5	0.1
4	P1	14.6	-0.4
4	P2	19.3	0.0
4	P3	19.5	-0.4
4	P4	14.4	0.3
5	P1	14.2	0.4
5	P2	19.1	0.8
5	P3	19.2	0.5
5	P4	14.4	0.0
6	P1	14.3	0.1
6	P2	19.2	0.3
6	P3	19.5	0.0
6	P4	14.5	-0.3
7	P1	14.1	0.1
7	P2	19.1	0.8
7	P3	19.0	0.9
7	P4	14.7	-0.4
8	P1	14.1	0.5
8	P2	19.1	0.8
8	P3	18.9	0.3
8	P4	14.3	0.3
9	P1	14.1	0.4
9	P2	18.9	1.0
9	P3	19.0	0.1
9	P4	14.1	0.6
10	P1	14.3	0.3
10	P2	19.1	0.7
10	P3	19.2	0.3
10	P4	14.3	0.1

Shell

	mOhm values	Actual	Delta
Board	Position	Initial	1500 Cycles
1	P1	4.4	-0.7
1	P2	4.7	-0.8
2	P1	4.5	-0.7
2	P2	4.3	-0.5
3	P1	4.2	0.0
3	P2	4.4	-0.3
4	P1	4.2	-0.2
4	P2	4.1	-0.2
5	P1	4.6	-0.8
5	P2	5.0	-1.0
6	P1	4.3	-0.7
6	P2	4.3	-0.5
7	P1	4.4	-0.4
7	P2	4.1	-0.2
8	P1	5.6	-2.0
8	P2	5.9	-2.2
9	P1	5.5	-1.9
9	P2	5.8	-2.3
10	P1	5.4	-1.4
10	P2	5.5	-1.4

Tracking Code: TC0943--2846--CH	Part #: USBR-B-S-F-O-VT
Part description: USBR	

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-MO-03

Description: Micro-ohmmeter

Manufacturer: Keithley

Model: 580

Serial #: 297288

Accuracy: Last Cal: 2009-7-22, Next Cal: 2010-7-21

Equipment #: HZ-TCT-02

Description: Mating-Un\mating analyzer

Manufacturer: SA PRECISION INSTRUMENTS

Model: 1220S

Serial #: 200620

Accuracy: Last Cal: 2009-12-14, Next Cal: 2010-12-13