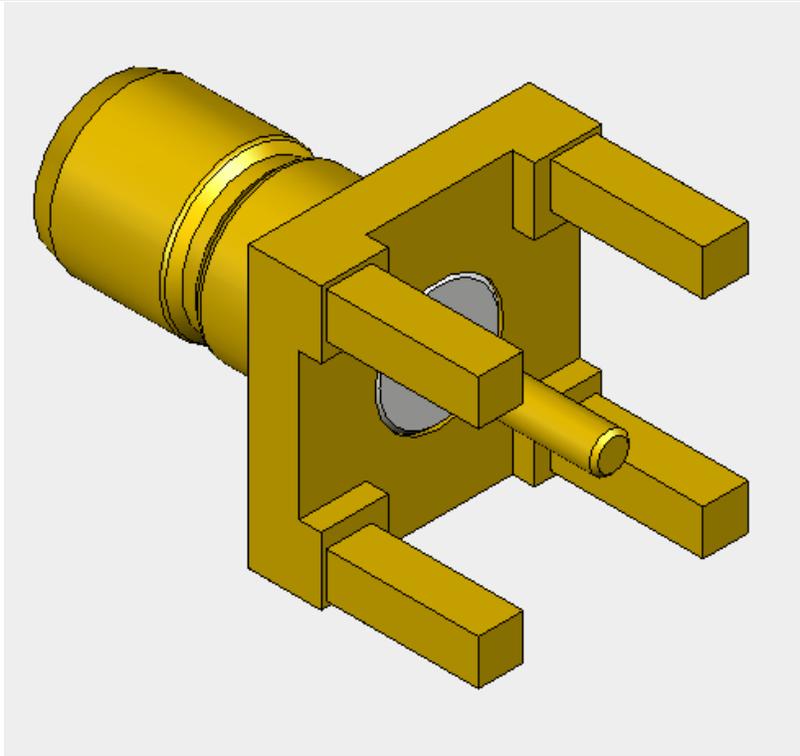




Project Number:		Tracking Code: TC0631--1122	
Requested by: John Riley		Date: 7/31/2006	Product Rev: A
Part #: SMB7H-P-C-H-RA-CA3		Lot #: 99999	Tech: Tony Wagoner, Tori Meek, Troy Cook
Part description: SMB7H			Qty to test: 25
Test Start: 4-24-2007	Test Completed: 12/6/2007		



**SMB7H-J-P-H-ST-TH1
DESIGN VERIFICATION REPORT
Mated with SMB7H-P-C-H-RA-CA3**

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: Match RF DVT's and spec sheets provided. Mates with SMB7H-J-P-H-ST-TH1

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:
- 9) Re-Flow Time/Temp: See accompanying profile.
- 10) Samtec Test PCBs used:

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards) – None Required

FLOWCHARTS

IR / DWV

TEST STEP	GROUP B1 1 Board - 4 Samples Ambient	GROUP B2 1 Board - 4 Samples Thermal	GROUP B3 1 Board - 4 Samples Humidity
01	Initial IR/DWV	Thermal Aging	Humidity
02	DWV/Working Voltage	IR	IR
03		DWV/Working Voltage	DWV/Working Voltage
04			
05			
06			
07			

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

Time Condition 'B' (250 hours)

Humidity =EIA-364-31, Test Condition 4,105 deg C;

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

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

IR = EIA-364-21

DWV = EIA-364-20

Durability/Thermal Age/Cyclic Humidity

TEST STEP	GROUP A 16 Points 100 Cycles
01	LLCR-1
02	Data Review
03	100 Cycles
04	LLCR-2
05	Data Review
06	Thermal Age
07	LLCR-3
08	Data Review
09	Cyclic Humidity
10	LLCR-4

TEST STEP	GROUP B 16 Points 500 Cycles
01	LLCR-1
02	Data Review
03	500 Cycles
04	LLCR-2
05	Data Review
06	Thermal Age
07	LLCR-3
08	Data Review
09	Cyclic Humidity
10	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

FLOWCHARTS Continued**Contact Retention**

TEST STEP	GROUP A 10 Assy (min) Contact (Center Conductor) Retention Ambient
01	Pull on Contact
02	Data Review

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.

CONTACT RETENTION: The minimum force required to move the center conductor

- 1) Reference document: EIA-364-29, *Contact Retention Test Procedure for Electrical Connectors*

INSULATION RESISTANCE (IR):

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.

- 1) PROCEDURE:
 - a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Signal-to-Ground
 - ii. Electrification Time 2.0 minutes
 - iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
- 2) MEASUREMENTS:
- 3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomenon. Separate samples are used to evaluate the effect of environmental stresses so not to influence the readings from arcing that occurs during the measurement process.

- 1) PROCEDURE:
 - a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
 - b. Test Conditions:
 - i. Between Signal-to-Ground
 - ii. Rate of Application 500 V/Sec
 - iii. Test Voltage (VAC) until breakdown occurs

ATTRIBUTE DEFINITIONS Continued**2) MEASUREMENTS/CALCULATIONS**

- a. The breakdown voltage shall be measured and recorded.
- b. The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
- c. The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

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

Insulation Resistance minimums, IR

- **Initial**
 - Mated----- 100,000 Meg Ω ----- Pass
- **Thermal**
 - Mated----- 100,000 Meg Ω
- **Humidity**
 - Mated----- 50,000 Meg Ω

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
 - **Breakdown**
 - Mated----- 1400 VAC
 - **DWV**
 - Mated----- 1050 VAC
 - **Working voltage**
 - Mated----- 350 VAC
- **Thermal**
 - **Breakdown**
 - Mated----- 1500 VAC
 - **DWV**
 - Mated----- 1125 VAC
 - **Working voltage**
 - Mated----- 375 VAC
- **Humidity**
 - **Breakdown**
 - Mated----- 1000 VAC
 - **DWV**
 - Mated----- 750 VAC
 - **Working voltage**
 - Mated----- 250 VAC

LLCR Durability (8 LLCR test points) – Ground (100 Cycles)

- **Initial**----- 12.7 mOhms Max
- **Durability, 100 Cycles**
 - $\leq +5.0$ mOhms -----8 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**
 - $\leq +5.0$ mOhms ----- 8 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

RESULTS Continued

- **Humidity**

- $\leq +5.0$ mOhms ----- 8 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

LLCR Durability (8 LLCR test points) – Signal (100 Cycles)

- **Initial** ----- 117.7 mOhms Max
- **Durability, 100 Cycles**
 - $\leq +5.0$ mOhms ----- 8 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**
 - $\leq +5.0$ mOhms ----- 8 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**

- $\leq +5.0$ mOhms ----- 8 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
-

LLCR Durability (8 LLCR test points) – Ground (500 Cycles)

- **Initial** ----- 10.3 mOhms Max
- **Durability, 500 Cycles**
 - $\leq +5.0$ mOhms ----- 8 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**
 - $\leq +5.0$ mOhms ----- 8 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

RESULTS Continued

- **Humidity**

○	<= +5.0 mOhms -----	8 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

LLCR Durability (8 LLCR test points) – Signal (500 Cycles)

- **Initial** ----- 117.7 mOhms Max

- **Durability, 500 Cycles**

○	<= +5.0 mOhms -----	8 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 -----	8 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 -----	8 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

DATA SUMMARIES**CONTACT RETENTION:**

Contact Retention	Force (Lbs)
Minimum	23.76
Maximum	30.14
Average	28.0

INSULATION RESISTANCE (IR):

	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Mated	Unmated	Mated	Unmated	Mated	Unmated
	<u>Insulation Resistance</u>					
Average	100000	#DIV/0!	100000	#DIV/0!	83333	#DIV/0!
Min	100000	0	100000	0	50000	0
Max	100000	0	100000	0	100000	0

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

	Initial, VAC Mated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1600	1200	400
Min	1400	1050	350
Max	1900	1425	475

	Thermal, VAC Mated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1567	1175	392
Min	1500	1125	375
Max	1600	1200	400

	Humidity, VAC Mated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1233	925	308
Min	1000	750	250
Max	1400	1050	350

DATA SUMMARIES Continued**LLCR (100 and 500 CYCLES):**

- 1) A total of 8 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	11/7/2007	11/14/2007	11/26/2007	12/6/2007
Room Temp C			22	23	21	21
RH			21%	55%	32%	27%
Name			Tori Meek	Tori Meek	Tori Meek	Tori Meek
mOhm values			Actual Initial	Delta Cycling	Delta Thermal	Delta Humidity
Signal-100	Average		116.9	0.2	0.2	2.0
	St. Dev.		0.7	0.8	1.0	2.5
	Min		115.8	-1.1	-1.3	-0.9
	Max		117.7	1.3	1.6	4.9
	Count		8	8	8	8
Ground-100	Average		10.4	-0.2	0.7	1.8
	St. Dev.		1.1	1.4	2.1	1.8
	Min		9.4	-3.3	-3.2	-1.9
	Max		12.7	1.5	3.6	3.9
	Count		8	8	8	8
Signal-500	Average		116.5	0.6	-0.1	-0.1
	St. Dev.		0.9	0.7	0.6	1.0
	Min		115.0	-0.6	-1.2	-1.7
	Max		117.7	1.3	0.7	1.0
	Count		8	8	8	8
Ground-500	Average		9.6	0.0	0.5	1.6
	St. Dev.		0.6	0.2	0.5	1.0
	Min		8.7	-0.3	-0.1	0.3
	Max		10.3	0.3	1.2	3.4
	Count		8	8	8	8

DATA**CONTACT RETENTION:**

Contact Retention	Retention
Sample#	Maximum Force (Lbs)
1	28.16
2	24.46
3	27.82
4	23.76
5	29.90
6	28.89
7	29.80
8	27.95
9	30.14
10	29.57

INSULATION RESISTANCE (IR):

Sample #	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Mated	Unmated	Mated	Unmated	Mated	Unmated
	<u>Insulation Resistance</u>					
1	100000		100000		100000	
2	100000		100000		50000	
3	100000		100000		100000	
4						

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Sample #	Initial, VAC Mated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
	1	1400	1050
2	1500	1125	375
3	1900	1425	475
Sample #	Thermal, VAC Mated		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
	1	1600	1200
2	1600	1200	400
3	1500	1125	375
4		0	0

DATA Continued

Sample #	Humidity, VAC Mated		
	<u>Breakdown</u>	<u>DWV</u>	<u>Working</u>
	<u>Voltage</u>		<u>Voltage</u>
1	1400	1050	350
2	1000	750	250
3	1300	975	325
4		0	0

LLCR (100 and 500 CYCLES):

mOhm values		Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
Signal-100	P1	116.9	-0.7	-0.1	-0.8
Signal-100	P2	117.4	0.1	-0.4	4.7
Signal-100	P3	117.7	0.9	1.1	0.1
Signal-100	P4	117.5	0.5	1.1	4.9
Signal-100	P5	116.0	1.3	-0.4	1.8
Signal-100	P6	116.7	-0.1	0.2	4.6
Signal-100	P7	115.8	1.0	1.6	2.0
Signal-100	P8	116.8	-1.1	-1.3	-0.9
Ground-100	P1	9.7	0.0	0.2	1.6
Ground-100	P2	10.4	0.2	0.6	3.9
Ground-100	P3	10.2	-0.3	3.1	2.5
Ground-100	P4	10.8	0.2	0.6	2.6
Ground-100	P5	10.4	0.1	0.4	1.8
Ground-100	P6	9.4	0.3	0.4	0.9
Ground-100	P7	12.7	-3.3	-3.2	-1.9
Ground-100	P8	9.4	1.5	3.6	3.5
Signal-500	P1	115.6	0.8	0.3	-0.2
Signal-500	P2	116.7	0.0	-0.7	-1.2
Signal-500	P3	115.0	1.3	0.2	1.0
Signal-500	P4	116.0	1.2	0.0	-0.5
Signal-500	P5	116.8	0.3	0.7	0.6
Signal-500	P6	117.5	0.5	-0.6	0.6
Signal-500	P7	117.7	-0.6	-1.2	-1.7
Signal-500	P8	116.7	1.1	0.2	1.0
Ground-500	P1	8.7	0.3	1.2	1.9
Ground-500	P2	9.5	0.1	0.8	0.8
Ground-500	P3	9.0	-0.2	0.1	3.4
Ground-500	P4	9.6	0.2	0.9	0.3
Ground-500	P5	10.3	-0.3	-0.1	2.6
Ground-500	P6	10.3	0.1	0.5	1.3
Ground-500	P7	9.6	0.0	0.2	1.4
Ground-500	P8	10.0	0.0	0.1	0.9

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** STG-01**Description:** Hipot Megomter Safety Test Cage**Manufacturer:** Hipotronics**Model:** TC-25**Serial #:** M9910141**Accuracy:** N/A

... Last Cal: No Calibration Required, Next Cal:

Equipment #: HPM-01**Description:** Hipot Megommeter**Manufacturer:** Hipotronics**Model:** H306B-A**Serial #:** M9905004**Accuracy:** 2 % Full Scale Accuracy

... Last Cal: 06/22/07, Next Cal: 06/22/08

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: 06/62/07, Next Cal: 06/22/08

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

... Last Cal: 9/21/2007, Next Cal: 9/21/2008

Equipment #: MO-04**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0798688**Accuracy:** See Manual

... Last Cal: 03/8/07, Next Cal: 03/8/08

Equipment #: MO-05**Description:** Digital Multimeter (7.5 Digits)**Manufacturer:** Keithley**Model:** KEI 2001**Serial #:** 0649520**Accuracy:** See Manual

... Last Cal: 02/12/2007, Next Cal: 02/12/2008

Equipment #: TCT-04**Description:** Dillon Quantrol TC21 25-1000 mm/min series test stand**Manufacturer:** Dillon Quantrol**Model:** TC2 I series test stand**Serial #:** 04-1041-04**Accuracy:** Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed;
... Last Cal: 05/18/2007, Next Cal: 05/18/2008**Equipment #:** LC-1000N (icell)**Description:** 1000 N icell load cell for Dillon Test stand**Manufacturer:** Mecmesin (Dillon/Quantrol)**Model:** icell**Serial #:** 06-0052-12**Accuracy:** .10 % of capacity

... Last Cal: 04/16/2007, Next Cal: 04/16/2008

Equipment #: DFT-10**Description:** Chatillon Remote Load Gage**Manufacturer:** Chatillon**Model:** DFT-10 (SENT TO COSTA RICA)**Serial #:** H00160**Accuracy:** +/- 0.01% of Full Scale (10lb) Not Used - Same gage as FG-8

... Last Cal: 01/15/05, Next Cal: 04/01/2099

...