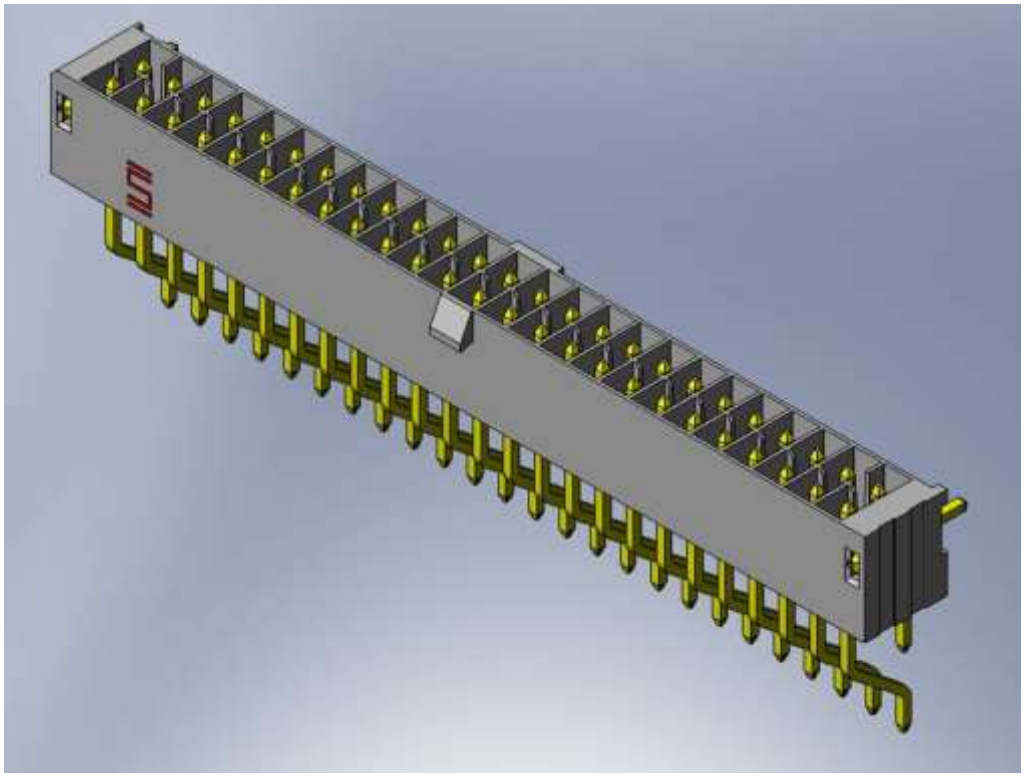
Project Number:	Tracking Code: TC0828--1786 ReportRev2		
Requested by: Keith Guetig	Date: 9/9/2008	Product Rev: 0	
Part #: IPL1-125-01-S-DH	Lot #: 0	Tech: Rodney Riley, Gary Lomax, & Eric Fox	Eng: Troy Cook
Part description: Dual Horizontal			Qty to test: 46
Test Start: 7/6/2008	Test Completed: 9/8/2008		



DESIGN VERIFICATION TESTING

PART DESCRIPTION

IPL1-125-01-S-DH

Mated with

MMSD-25-20-S-06.00-D-LUS

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
10/21/2015	**2**	**Remove the CCC data**	**PC**

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

SCOPE

To perform the following tests: Design Verification Testing

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-101239-TST-XX, PCB-101242-TST-XX

FLOWCHARTS

IR / DWV

TEST STEP	GROUP A 2 Boards Ambient	GROUP B1 2 Boards Ambient	GROUP B2 2 Boards Thermal	GROUP B3 2 Boards Humidity
01	IR	DWV/Working Voltage	Thermal Aging	Humidity
02	Data Review		DWV/Working Voltage	DWV/Working Voltage
03	Thermal Aging			
04	IR			
05	Data Review			
06	Humidity			
07	IR			

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 to 98% RH)
ambient pre-condition and delete steps 7a and 7b
IR = EIA-364-21
DWV = EIA-364-20

FLOWCHARTS Continued

Mating/Unmating/Normal Force

TEST STEP	GROUP A 10 Boards 100 Cycles
01	Contact Meas.
02	Mating / Unmating
03	Data Review
04	100 Cycles
05	Mating / Unmating
06	Contact Meas.
07	Data Review
08	Thermal Aging (Mated)
09	Mating / Unmating
10	Contact Meas.
11	Data Review
12	Humidity (Mated)
13	Mating / Unmating
14	Contact Meas.

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 to 98% RH)
ambient pre-condition and delete steps 7a and 7b
Mating/Un-Mating Forces = EIA-364-13
Contact Gaps/Height - No standard method. Usually measured optically

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 GAPS:

1) Gaps above the surrounding plastic surface were measured before and after stressing the contacts (e.g. thermal aging, mechanical cycling, etc.).
2) Typically, all contacts on the connector are measured.

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.

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 Adjacent Contacts or 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.

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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 Adjacent Contacts or Signal-to-Ground
        ii. Rate of Application 500 V/Sec
        iii. Test Voltage (VAC) until breakdown occurs
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).

RESULTS

Contact Gaps

- **Initial**
  - **Min----------.015”**
  - **Max ----------.018”**
- **After 100 Cycles**
  - **Min----------.014”**
  - **Max ----------.018”**
- **Thermal**
  - **Min----------.017”**
  - **Max ----------.022”**
- **Humidity**
  - **Min----------.016”**
  - **Max ----------.021”**

Mating – Unmating Forces

- **Initial**
  - **Mating**
    - **Min ---------- 4.1 lbs**
    - **Max---------- 8.8 lbs**
  - **Unmating**
    - **Min ---------- 3.3 lbs**
    - **Max---------- 5.1 lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 4.9 lbs**
    - **Max---------- 9.5 lbs**
  - **Unmating**
    - **Min ---------- 3.8 lbs**
    - **Max---------- 6.4 lbs**
- **Thermal**
  - **Mating**
    - **Min ---------- 3.9 lbs**
    - **Max---------- 8.1 lbs**
  - **Unmating**
    - **Min ---------- 3.4 lbs**
    - **Max---------- 6.7 lbs**
- **Humidity**
  - **Mating**
    - **Min ---------- 3.0 lbs**
    - **Max---------- 5.5 lbs**
  - **Unmating**
    - **Min ---------- 3.3 lbs**
    - **Max---------- 6.2 lbs**

Insulation Resistance minimums, IR

- **Initial**
  - **Mated ---------- 10,000 Meg Ω ---------- Pass**
  - **IPL1 ----------100,000 Meg Ω**
- **Thermal**
  - **Mated ----------100,000 Meg Ω**
  - **IPL1 ----------100,000 Meg Ω**
- **Humidity**
  - **Mated ---------- 15,000 Meg Ω**
  - **IPL1 ----------100,000 Meg Ω**

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
  - **Breakdown**
    - **Mated ----------1,900 VAC**
    - **IPL1 ---------- 2,300VAC**
  - **DWV**
    - **Mated ----------1,425 VAC**
    - **IPL1 ----------1,725 VAC**
  - **Working voltage**
    - **Mated ----------633.3 VAC**
    - **IPL1 ----------766.7 VAC**
- **Thermal**
  - **Breakdown**
    - **Mated ----------1,800 VAC**
    - **IPL1 ----------2,100 VAC**
  - **DWV**
    - **Mated ----------1,350 VAC**
    - **IPL1 ----------1,575 VAC**
  - **Working voltage**
    - **Mated ----------600 VAC**
    - **IPL1 ----------700 VAC**
- **Humidity**
  - **Breakdown**
    - **Mated ----------1,850 VAC**
    - **IPL1 ----------2,400 VAC**
  - **DWV**
    - **Mated ----------1,387.5 VAC**
    - **IPL1 ----------1,800 VAC**
  - **Working voltage**
    - **Mated ----------616.7 VAC**
    - **IPL1 ----------800 VAC**

DATA SUMMARIES

CONTACT GAPS:

Initial		After 100 Cycles		After Thermal		After Humidity	
Measured in inches		Measured in inches		Measured in inches		Measured in inches	
Minimum	0.0146	***Minimum***	0.0143	***Minimum***	0.0169	***Minimum***	0.0162
Maximum	0.0180	***Maximum***	0.0178	***Maximum***	0.0218	***Maximum***	0.0213
Average	0.0168	***Average***	0.0167	***Average***	0.0188	***Average***	0.0194
St. Dev.	0.0005	***St. Dev.***	0.0006	***St. Dev.***	0.0008	***St. Dev.***	0.0009
Count	100	***Count***	100	***Count***	100	***Count***	100

MATING/UNMATING:

	Initial				After 100 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	65.1	4.07	52.6	3.29	78.9	4.93	60.5	3.78
Maximum	141.0	8.8	82.1	5.1	152.3	9.5	102.6	6.4
Average	99.9	**6.2**	65.4	**4.1**	110.9	**6.9**	77.6	**4.8**
	After Thermal				After Humidity			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	61.7	3.86	54.6	3.41	48.2	3.01	52.6	3.29
Maximum	129.1	8.1	107.2	6.7	88.2	5.5	98.4	6.2
Average	85.1	**5.3**	70.7	**4.4**	61.0	**3.8**	64.6	**4.0**

DATA SUMMARIES Continued

INSULATION RESISTANCE (IR):

	Pin-Pin		
	Mated	Unmated	
Minimum	IPL1/MMSD	IPL1	MMSD
Initial	10000	100000	Not Tested
Thermal	100000	100000	Not Tested
Humidity	15000	100000	Not Tested

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

		Pin-Pin		
		Mated	Unmated	
Minimum		IPL1/MMSD	IPL1	MMSD
Breakdown Voltage	Initial	1900	2300	Not Tested
	Thermal	1800	2100	Not Tested
	Humidity	1850	2400	Not Tested
DWV	Initial	1425	1725	Not Tested
	Thermal	1350	1575	Not Tested
	Humidity	1387.5	1800	Not Tested
Working Voltage	Initial	633.3	766.7	Not Tested
	Thermal	600	700	Not Tested
	Humidity	616.7	800	Not Tested

DATA

CONTACT GAPS:

Initial			After 100 Cycles			After Thermal			After Humidity		
Measured in inches			Measured in inches			Measured in inches			Measured in inches		
Pos.#	**B1**	**B2**	**Pos.#**	**B1**	**B2**	**Pos.#**	**B1**	**B2**	**Pos.#**	**B1**	**B2**
1	0.0166	0.018	**1**	0.01701	0.01528	**1**	0.01811	0.02016	**1**	0.02126	0.018504
2	0.0173	0.0176	**2**	0.01709	0.01756	**2**	0.01772	0.01898	**2**	0.020472	0.01937
3	0.0168	0.0169	**3**	0.01709	0.01741	**3**	0.01764	0.01866	**3**	0.020394	0.019685
4	0.0168	0.0167	**4**	0.01693	0.01701	**4**	0.01874	0.01953	**4**	0.020394	0.019921
5	0.0171	0.0168	**5**	0.01709	0.01709	**5**	0.01851	0.01882	**5**	0.020787	0.019291
6	0.0161	0.0169	**6**	0.01662	0.01701	**6**	0.01866	0.01969	**6**	0.021024	0.01937
7	0.0162	0.017	**7**	0.01709	0.01678	**7**	0.01945	0.01937	**7**	0.019921	0.019528
8	0.0165	0.0163	**8**	0.01693	0.01646	**8**	0.01819	0.01906	**8**	0.020394	0.019449
9	0.0166	0.0167	**9**	0.01654	0.01701	**9**	0.01811	0.01937	**9**	0.019606	0.019685
10	0.0164	0.0172	**10**	0.01678	0.0178	**10**	0.01843	0.01858	**10**	0.020787	0.019842
11	0.0168	0.0169	**11**	0.01646	0.0167	**11**	0.0189	0.01906	**11**	0.019921	0.018661
12	0.0162	0.0165	**12**	0.01685	0.0167	**12**	0.01882	0.01929	**12**	0.020236	0.018504
13	0.0169	0.0167	**13**	0.01685	0.01654	**13**	0.01772	0.01858	**13**	0.019921	0.018031
14	0.0164	0.0157	**14**	0.01646	0.01599	**14**	0.01976	0.01866	**14**	0.020472	0.018583
15	0.0169	0.0162	**15**	0.01678	0.01638	**15**	0.01819	0.01866	**15**	0.019764	0.01811
16	0.0163	0.0169	**16**	0.01615	0.01662	**16**	0.01921	0.01898	**16**	0.020079	0.018819
17	0.0163	0.0161	**17**	0.01662	0.01567	**17**	0.01921	0.01819	**17**	0.019842	0.019134
18	0.0169	0.0168	**18**	0.01654	0.01685	**18**	0.01921	0.01795	**18**	0.018268	0.018346
19	0.0173	0.017	**19**	0.01693	0.01654	**19**	0.01969	0.01693	**19**	0.019685	0.020157
20	0.0164	0.0169	**20**	0.01685	0.01654	**20**	0.01953	0.01945	**20**	0.019055	0.020472
21	0.0169	0.0165	**21**	0.01678	0.01607	**21**	0.01921	0.01725	**21**	0.017323	0.019842
22	0.0168	0.0171	**22**	0.01717	0.01646	**22**	0.01937	0.0178	**22**	0.01685	0.019842
23	0.0172	0.0171	**23**	0.01748	0.01662	**23**	0.01984	0.01866	**23**	0.019764	0.019842
24	0.0169	0.0165	**24**	0.01693	0.01615	**24**	0.02008	0.01937	**24**	0.01685	0.020394
25	0.0173	0.017	**25**	0.01756	0.01725	**25**	0.01984	0.01992	**25**	0.02	0.019764
26	0.0164	0.018	**26**	0.01678	0.01748	**26**	0.01882	0.01976	**26**	0.019134	0.019842
27	0.0164	0.0176	**27**	0.01709	0.0178	**27**	0.01937	0.02032	**27**	0.017716	0.019685
28	0.0165	0.0169	**28**	0.01654	0.01709	**28**	0.01819	0.01969	**28**	0.018504	0.019449
29	0.0168	0.0167	**29**	0.01646	0.01725	**29**	0.01874	0.01921	**29**	0.01622	0.019606
30	0.0167	0.0168	**30**	0.01693	0.01701	**30**	0.01914	0.01851	**30**	0.018661	0.019055
31	0.0178	0.0169	**31**	0.01646	0.01733	**31**	0.01953	0.01882	**31**	0.019134	0.019528
32	0.0166	0.017	**32**	0.01678	0.01709	**32**	0.01953	0.0189	**32**	0.020079	0.017716
33	0.0167	0.0163	**33**	0.01701	0.01701	**33**	0.01906	0.01795	**33**	0.019764	0.019685
34	0.0167	0.0167	**34**	0.01693	0.01662	**34**	0.01906	0.01866	**34**	0.019764	0.01874
35	0.0169	0.0172	**35**	0.01678	0.01717	**35**	0.01906	0.0189	**35**	0.019606	0.017953
36	0.0165	0.0169	**36**	0.01701	0.01685	**36**	0.01945	0.01882	**36**	0.01937	0.018661
37	0.0169	0.0165	**37**	0.01662	0.0167	**37**	0.01858	0.01858	**37**	0.019842	0.01874
38	0.017	0.0167	**38**	0.0167	0.01685	**38**	0.02181	0.01803	**38**	0.019606	0.018976
39	0.0169	0.0157	**39**	0.01701	0.01678	**39**	0.01709	0.01795	**39**	0.019449	0.019213
40	0.0146	0.0162	**40**	0.01552	0.01599	**40**	0.01732	0.01866	**40**	0.018819	0.01874
41	0.0169	0.0169	**41**	0.01701	0.01748	**41**	0.01756	0.0189	**41**	0.018976	0.018661
42	0.0173	0.0161	**42**	0.01559	0.01646	**42**	0.01788	0.01874	**42**	0.020945	0.019449
43	0.0173	0.0168	**43**	0.01685	0.01764	**43**	0.01961	0.01858	**43**	0.021024	0.018504
44	0.0171	0.017	**44**	0.01544	0.01693	**44**	0.01976	0.01803	**44**	0.020472	0.019528
45	0.0167	0.0169	**45**	0.01654	0.01638	**45**	0.01882	0.01764	**45**	0.020236	0.018819
46	0.0172	0.0165	**46**	0.01504	0.01701	**46**	0.01858	0.01843	**46**	0.020236	0.018661
47	0.0165	0.0171	**47**	0.01426	0.01685	**47**	0.02	0.01866	**47**	0.019921	0.018583
48	0.0172	0.0171	**48**	0.01575	0.01599	**48**	0.01906	0.01803	**48**	0.020315	0.019764
49	0.0172	0.0165	**49**	0.01717	0.01552	**49**	0.01953	0.01858	**49**	0.020551	0.019685
50	0.0171	0.017	**50**	0.0163	0.01622	**50**	0.01914	0.01866	**50**	0.02063	0.019055

DATA Continued

MATING/UNMATING:

	Initial		After 100 Cycles		After Thermal		After Humidity	
Sample#	Mating	Unmating	Mating	Unmating	Mating	Unmating	Mating	Unmating
1	4.80	3.99	6.01	4.64	3.86	3.77	3.72	3.98
2	8.30	5.13	7.78	4.89	4.48	4.04	5.51	6.15
3	6.43	4.05	7.39	6.41	5.98	4.82	5.15	5.51
4	5.69	3.58	6.40	3.78	4.01	3.41	3.50	3.68
5	4.07	3.29	4.93	4.03	6.59	4.85	3.13	3.45
6	5.33	3.90	5.87	4.39	5.56	4.66	3.01	3.32
7	5.31	3.58	6.25	4.52	4.13	3.61	3.17	3.38
8	8.81	4.42	9.52	5.22	5.97	4.50	4.50	4.25
9	6.68	4.38	7.37	5.35	4.53	3.78	3.04	3.29
10	7.00	4.57	7.81	5.26	8.07	6.70	3.40	3.38

INSULATION RESISTANCE (IR):

	Pin-Pin					
	Initial		Thermal		Humidity	
	Mated	Unmated	Mated	Unmated	Mated	Unmated
Sample #	IPL1/MMSD	IPL1	IPL1/MMSD	IPL1	IPL1/MMSD	IPL1
1	20000	100000	100000	100000	15000	100000
2	10000	100000	100000	100000	30000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

	Pin-Pin	
	Mated	Unmated
Minimum	IPL1/MMSD	IPL1
Initial	1900	2300
Thermal	1800	2100
Humidity	1850	2400

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: MV-04
Description: Micro-Vu Vector Video Measuring Microscope with InSpec Software
Manufacturer: Micro-Vu
Model: 301
Serial #: 7570
Accuracy: See Manual
… Last Cal: 02/05/07, Next Cal: 02/05/08

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 #: 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 #: LC-250N-2
Description: 250 N icell load cell for Dillon Test Stand
Manufacturer: Mecmesin (Dillon/Quantrol)
Model: ILC
Serial #: 07-0029-02
Accuracy: .10% of Capacity
… Last Cal: 02/15/2008, Next Cal: 02/15/2009

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 #: STG-01
Description: Hipot Megomter Safety Test Cage
Manufacturer: Hipotronics
Model: TC-25
Serial #: 2721A00648
Accuracy: N/A
… Last Cal: No Calibration Required, Next Cal:

Equipment #: Null
Description:
Manufacturer:
Model:
Serial #:
Accuracy:
… Last Cal: , Next Cal: