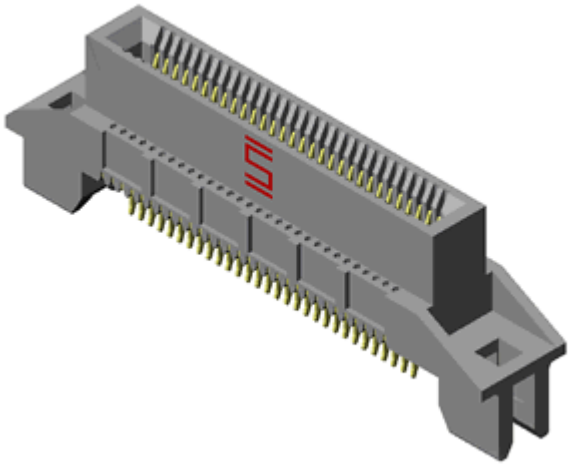
Project Number: MEC8-EM-02	Tracking Code: TC0311-MEC8-EM-02-0158		
Requested by: Jeremy Wooldridge	Date: 3/12/2003	Product Rev: 2	
Part #: MEC8-130-02-L-DEM2	Lot #: NONE	Tech: Troy Cook	Eng: John Tozier
Part description: MEC8-EM-02			Qty to test: 50
Test Start: 03/21/2003	Test Completed: 4/23/2003		



DVT
Summary Report

PART DESCRIPTION

MEC8-130-02-L-DEM2

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: DVT

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 testing were cleaned according to TLWI-0001:
   a) Sample test boards are to be ultrasonically cleaned after test lead attachment, preparation and/or soldering using the following process.
   b) Sample test boards are immersed into Branson 3510 cleaner containing Kyzen Ionox HC1 (or equivalent) with the following conditions:
      i) Temperature: ----------55° C+/- 5° C
      ii) Frequency:----------40 KHz
      iii) Immersion Time: ----------5 to 10 Minutes
      iv) Sample test boards are removed and placed into the Branson 3510 cleaner containing deionized water with the following conditions:
      v) Temperature: ----------55° C +/- 5° C
      vi) Frequency:----------40 KHz
      vii) Immersion Time: ----------5 to 10 Minutes
      viii) Sample test boards are removed and placed in a beaker positioned on a hot plate with a magnetic stirrer containing deionized water warmed to 55° C +/- 5° C for 1/2 to 1 minute
   c) Upon removal, the sample test boards are rinsed for 1/2 to 1 minute in room temperature free flowing deionized water.
   d) After the final rinse, the sample test boards are dried in an air-circulating oven for 10 to 15 minutes at 50° C +/- 5° C
   e) Sample test boards are then allowed to set and recover to room ambient condition prior to testing.
4) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
5) Any additional preparation will be noted in the individual test procedures.

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

FLOWCHARTS

TEST STEP	GROUP 1a 10 Boards 0.068" Card Mother/daughter mechanical with thermal/humidity	GROUP 1b 10 Boards 0.056" Card Mother/daughter mechanical with thermal/humidity	GROUP 1 200 test points 0.056" Card Contact durability with thermal/humidity	GROUP 1 1 board min 6 Contacts in series, 0.056" card Mother/daughter electrical
01	Mating / Unmating	Mating / Unmating	LLCR-1	CCC
02	Data Review	Data Review	Data eview	
03	100 Cycles	100 Cycles	100 Cycles	
04	Mating / Unmating	Mating / Unmating	LLCR-2	
05			Data eview	
06			Thermal Aging	
07			LLCR-3	
08			Data eview	
09			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 to 98% RH)
delete steps 7a and 7b
Mating/Un-Mating Forces = EIA-364-13
LLCR = EIA-364-23, LLCR
use Keithley 580 in the dry circuit mode, 10 mA Max
Tabulate calculated current at RT, 75° C, 80° C and 95° C
after derating 20% and based on 125 ° C
CCC, Temp rise = EIA-364-70

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

ATTRIBUTE DEFINITION

Following is a brief, simplified description of attributes.

THERMAL AGING:

1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors.*
   a) Test Condition 4 at 105° C.
   b) Test Time Condition B for 250 hours.
2) Connectors are mated.

CYCLIC HUMIDITY:

1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors.*
   a) Test Condition B, 240 Hours.
   b) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
2) Connectors are mated.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
4) The size of the temperature probe can affect the measured temperature.
5) Copper traces on PC boards will contribute to temperature rise:
   a) Self heating (resistive)
   b) Reduction in heat sink capacity affecting the heated contacts
6) A de-rating curve, usually 20%, is calculated.
7) Calculated de-rated currents at three temperature points are reported:
   a) Ambient
   b) $75\ ^{o}$ C
   c) $80\ ^{o}$ C
   d) $95\ ^{o}$ C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the MAXIMUM temperature in the vicinity of the heat generation area.
10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

ATTRIBUTE DEFINITIONS Continued

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) <= +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

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

RESULTS

Temperature Rise, CCC,) tested with the 0.056" Card

- **At 95°C, relative to 125°C----------1.8 A at 20% de-rated with 6 adjacent conductors powered**

Mating – Unmating Forces, Stressing with 0.056" Card

- **Initial**
  - **Mating**
    - **Min ---------- 4.79 lbs**
    - **Max---------- 8.78 lbs**
  - **Unmating**
    - **Min ---------- 3.04 lbs**
    - **Max---------- 4.19 lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 6.05 lbs**
    - **Max---------- 9.03 lbs**
  - **Unmating**
    - **Min ---------- 3.13 lbs**
    - **Max---------- 4.77 lbs**

Mating – Unmating Forces, Stressing with 0.068" Card

- **Initial**
  - **Mating**
    - **Min ---------- 8.23 lbs**
    - **Max----------10.56 lbs**
  - **Unmating**
    - **Min ---------- 5.80 lbs**
    - **Max---------- 8.96 lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 9.87 lbs**
    - **Max----------13.30 lbs**
  - **Unmating**
    - **Min ---------- 7.75 lbs**
    - **Max----------12.58 lbs**

LLCR Durability (200 LLCR test points) tested with the 0.056" Card

- **Initial---------- 15.8 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ----------200 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 ----------200 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: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

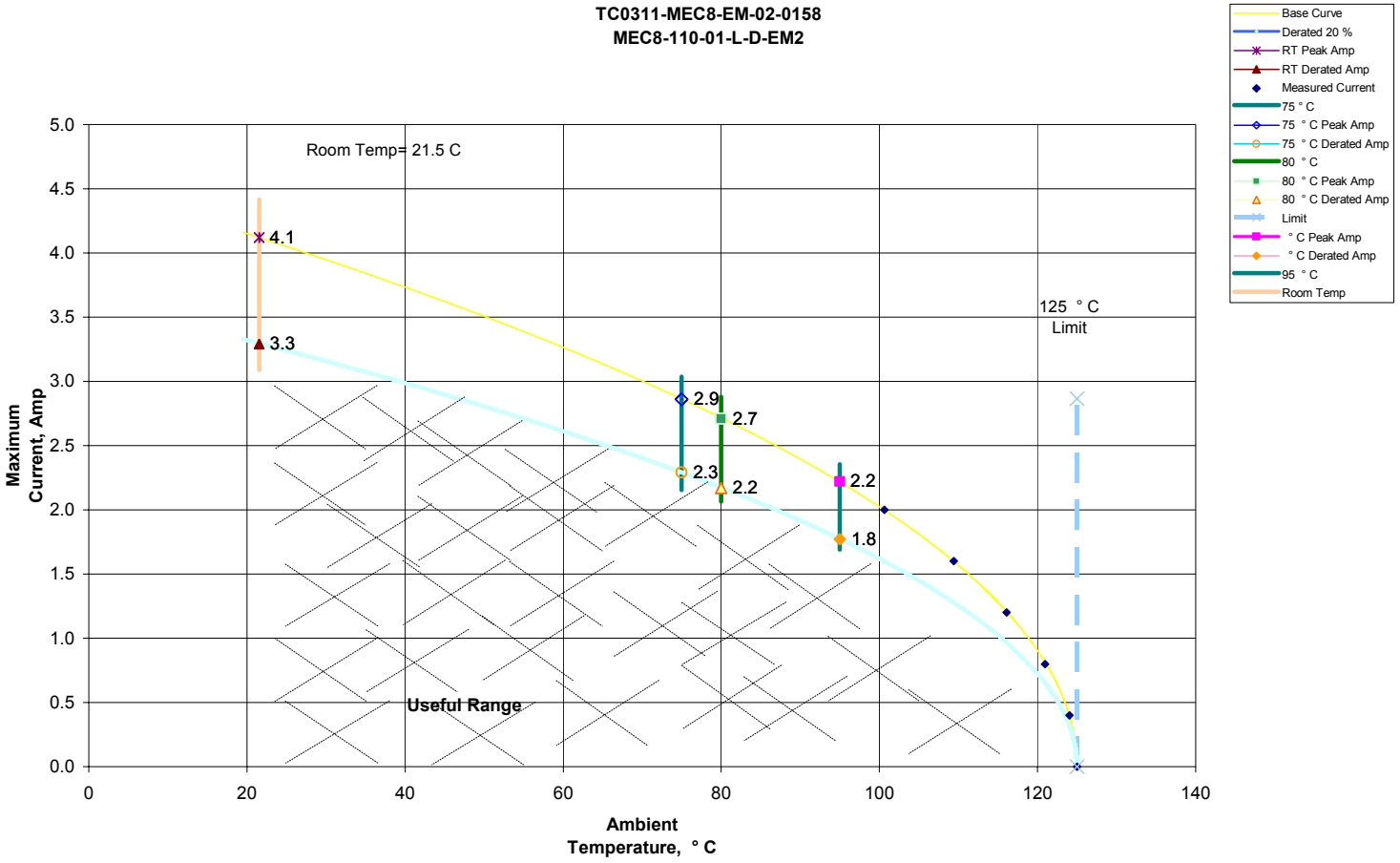
- **Humidity**
  - **<= +5.0 mOhms ---------- 200 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 0 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 0 Points ---------- Acceptable**
  - **+15.1 to +50.0 mOhms ---------- 0 Points ---------- Marginal**
  - **+50.1 to +2000 mOhms ---------- 0 Points ---------- Unstable**
  - **>+2000 mOhms ---------- 0 Points ---------- Open Failure**

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):

1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the MAXIMUM temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes apart, differ less than 1° C (computer controlled data acquisition).
4) Six adjacent contacts were powered:
   a) Linear configuration
   b) Clustered configuration

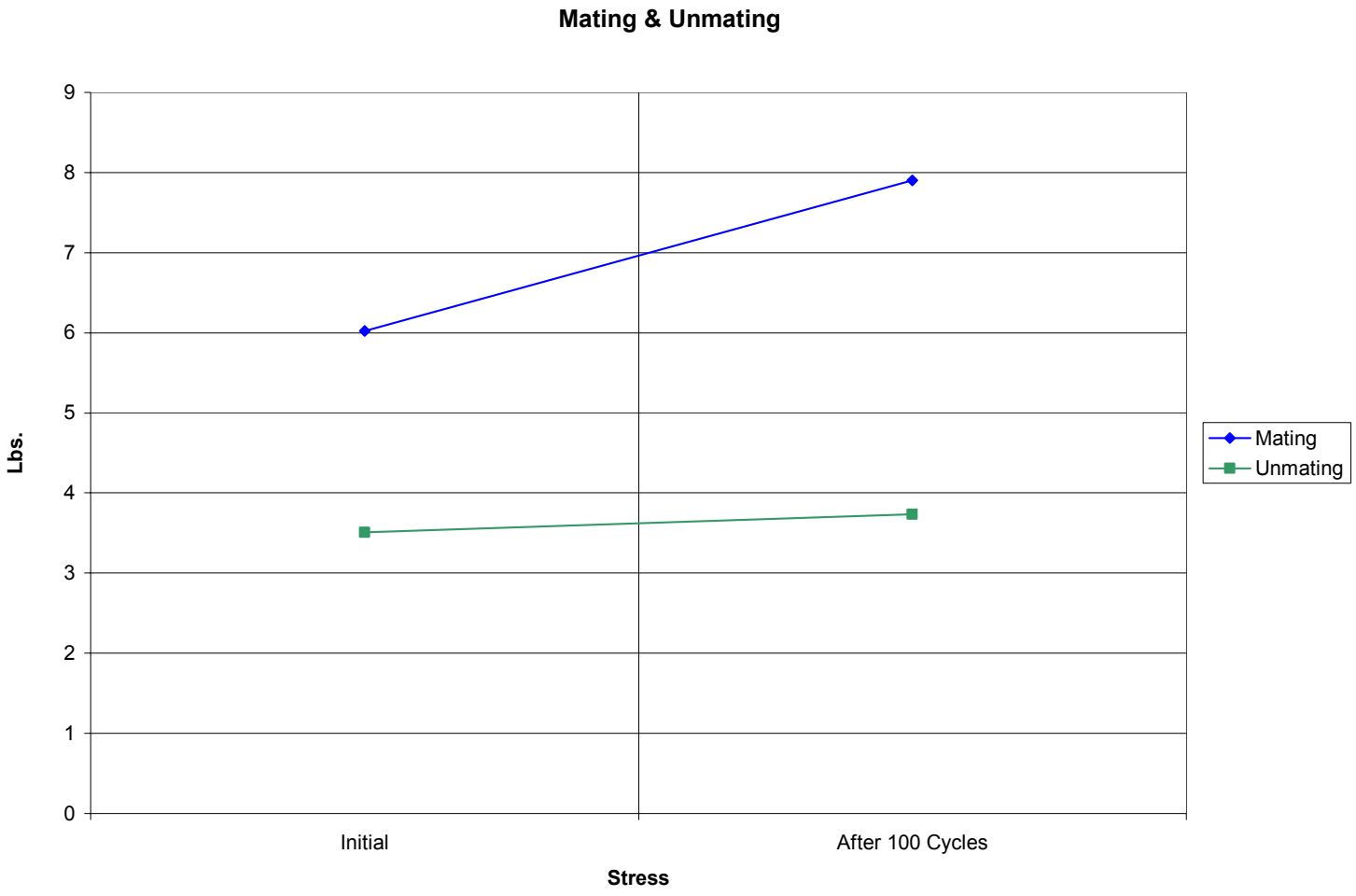


Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES Continued

MATING/UNMATING – Stressing with the 0.056" Card:

	Initial		After 100 Cycles	
	Mating Force (Lbs)	**Unmating** Force (Lbs)	**Mating** Force (Lbs)	**Unmating** Force (Lbs)
Minimum	4.791	3.036	6.045	3.134
Maximum	*8.781*	*4.185*	*9.030*	*4.767*
Average	***6.024***	***3.509***	***7.900***	***3.735***

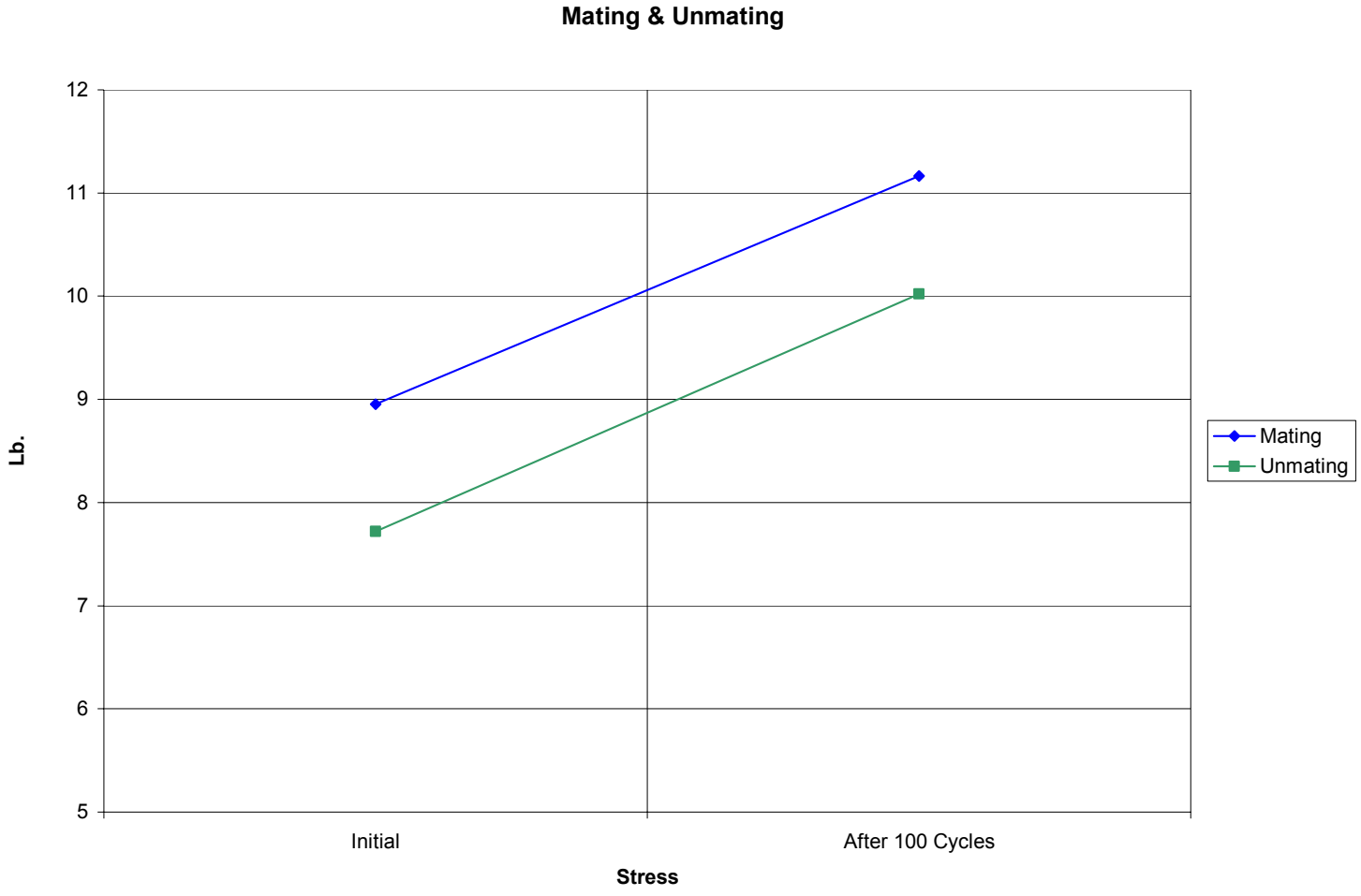


Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES Continued

MATING/UNMATING – Stressing with the 0.068" Card:

	Initial		After 100 Cycles	
	Mating Force (Lbs)	**Unmating** Force (Lbs)	**Mating** Force (Lbs)	**Unmating** Force (Lbs)
Minimum	8.227	5.797	9.866	7.746
Maximum	*10.560*	*8.964*	*13.300*	*12.580*
Average	***8.952***	***7.720***	***11.166***	***10.023***



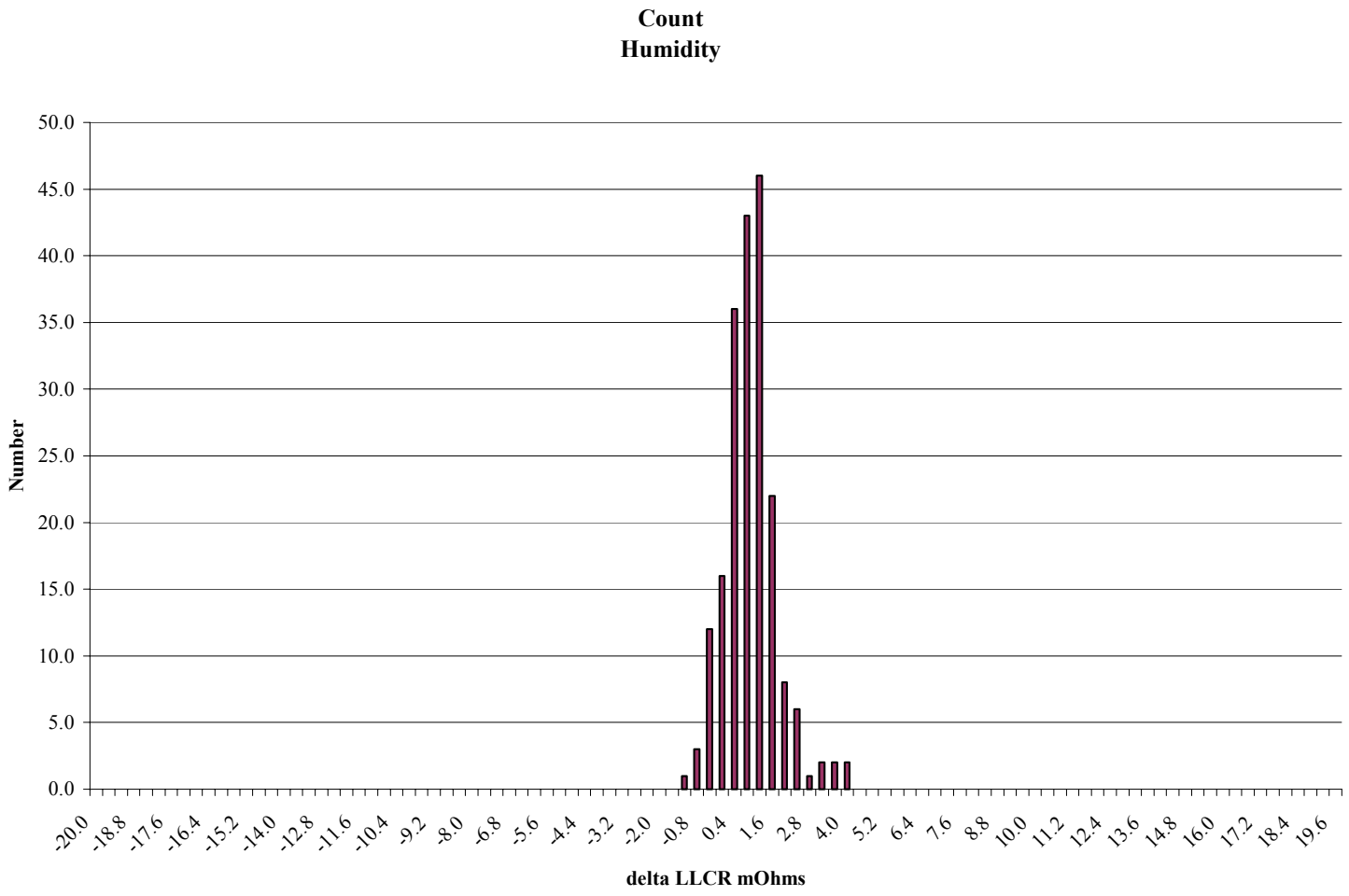
Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES Continued

LLCR:

1) A total of 200 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) <= +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

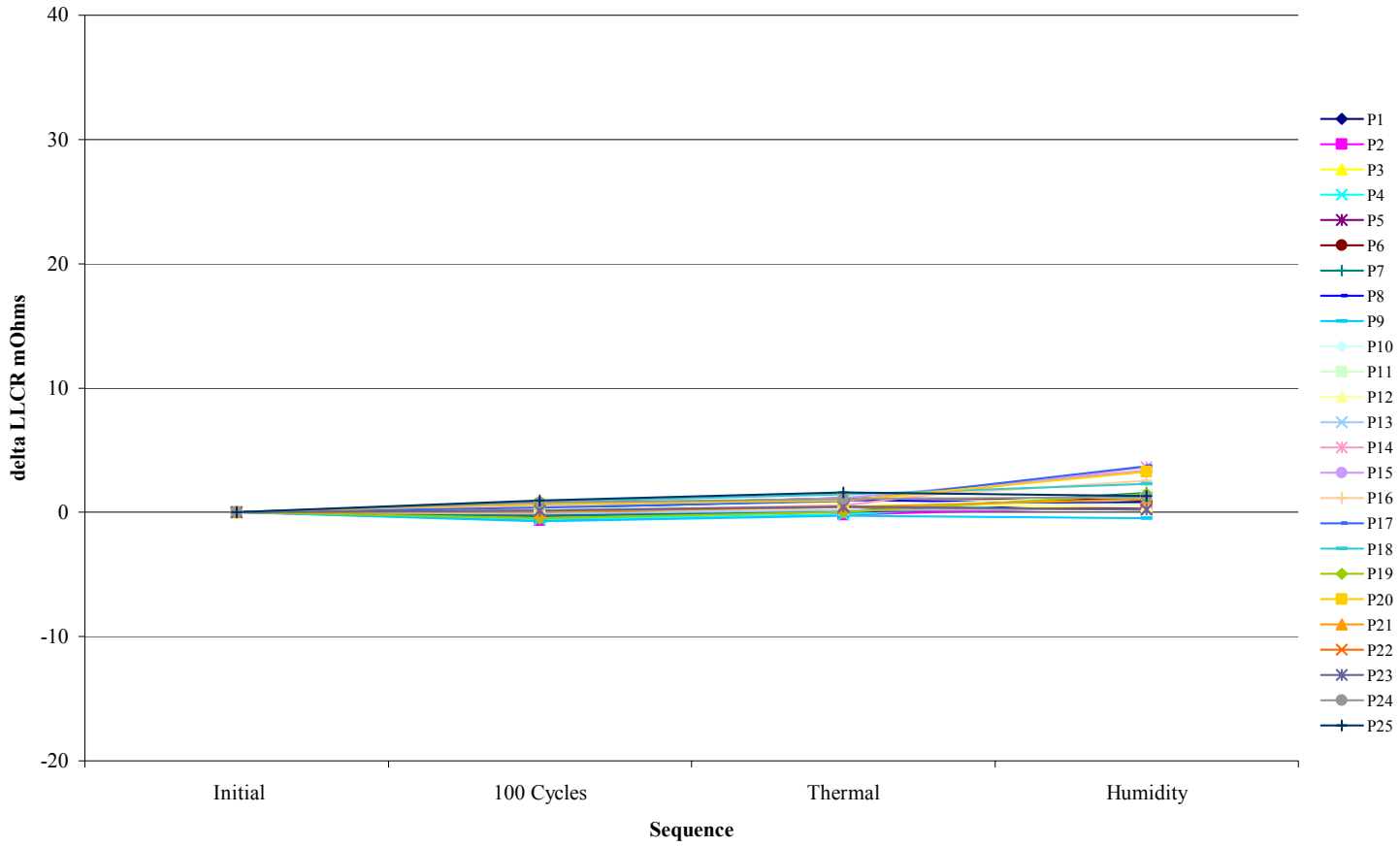
mOhm values	Actual Initial	Delta 100 Cycles	Delta Thermal	Delta Humidity
Average	17.1	0.0	0.5	0.7
St. Dev.	0.5	0.6	0.6	0.8
Min	16.3	-1.8	-1.4	-1.3
Max	19.0	1.5	2.1	3.7
Count	200	200	200	200



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

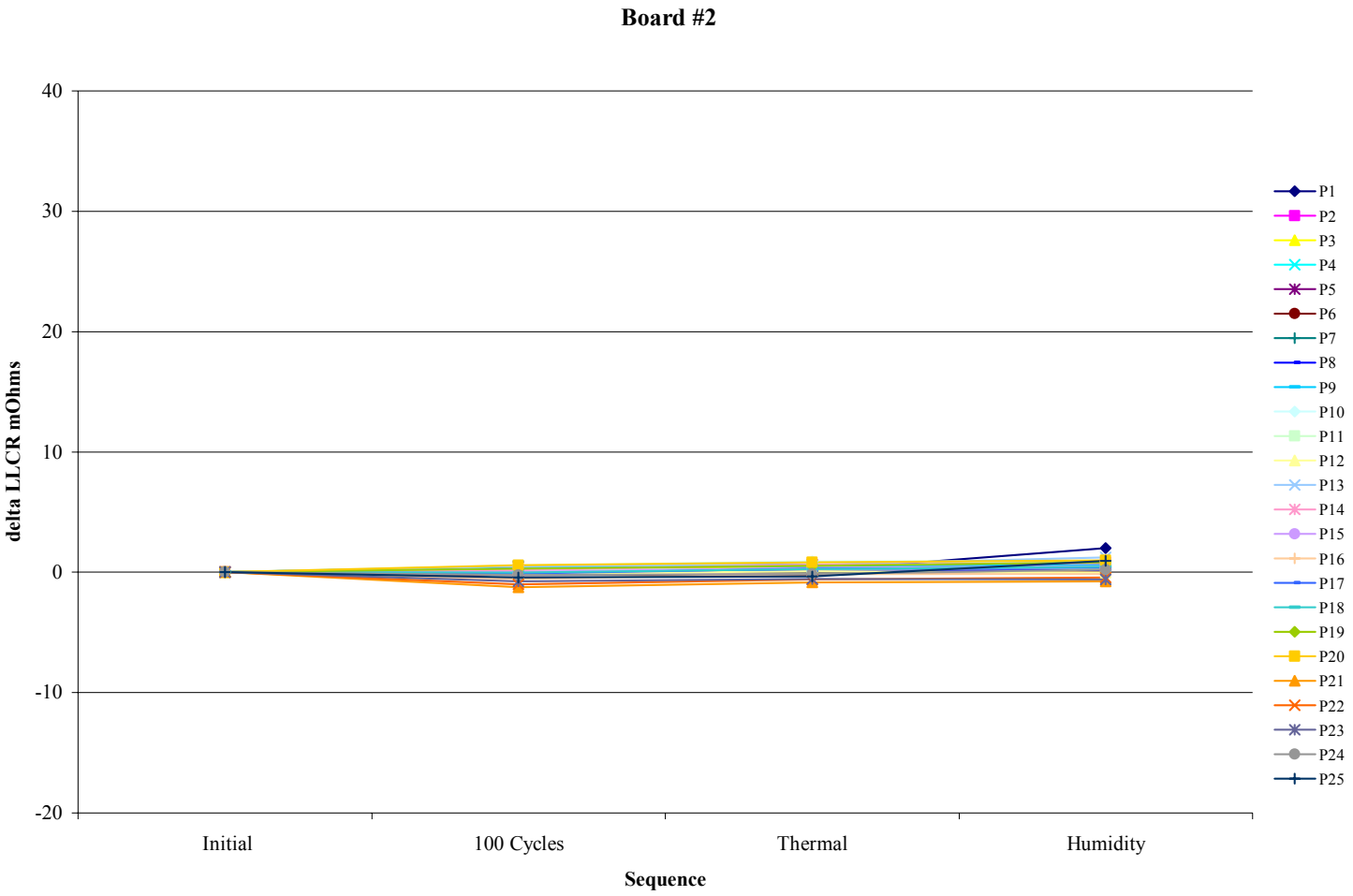
DATA SUMMARIES Continued

Board #1



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

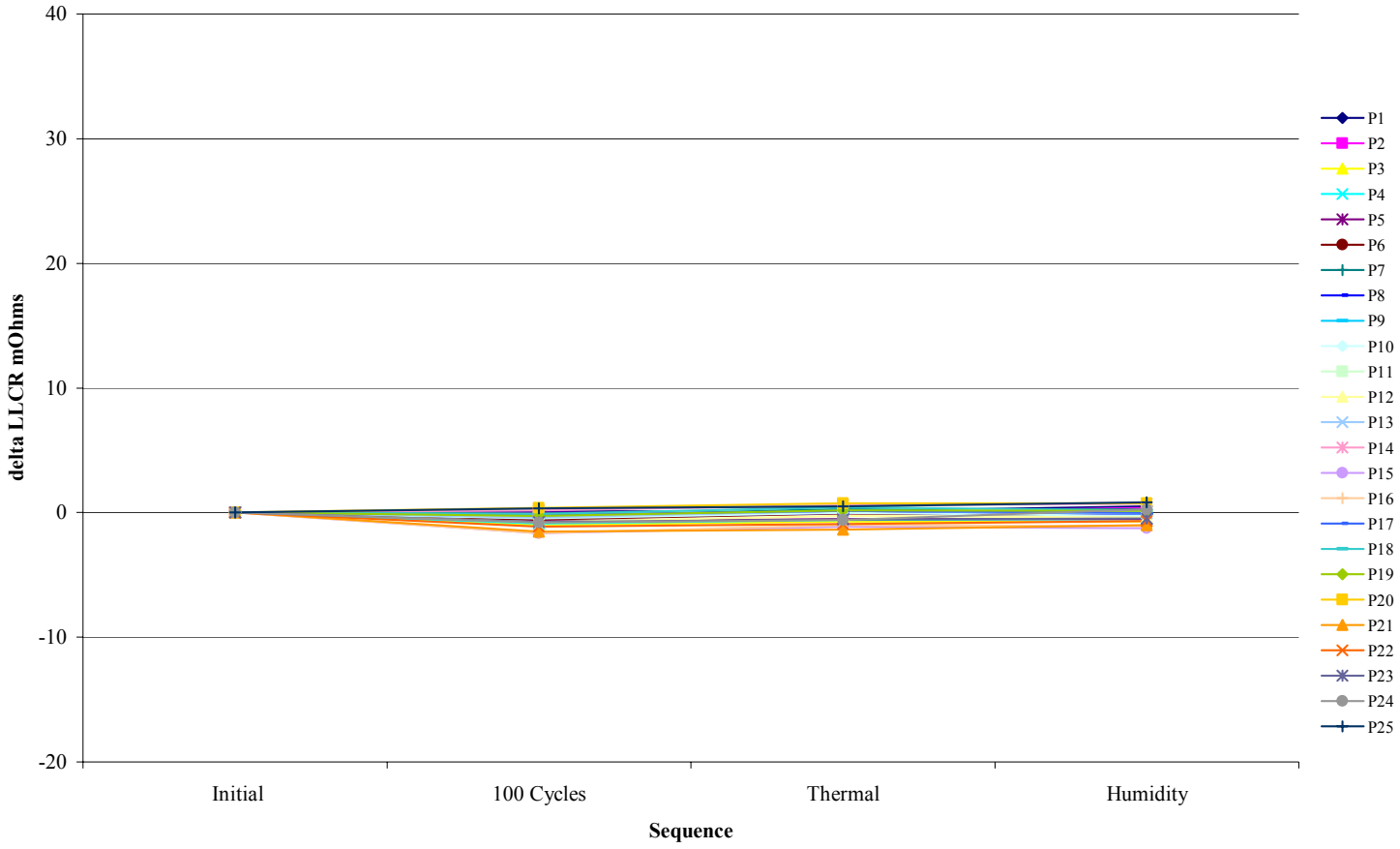
DATA SUMMARIES Continued



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

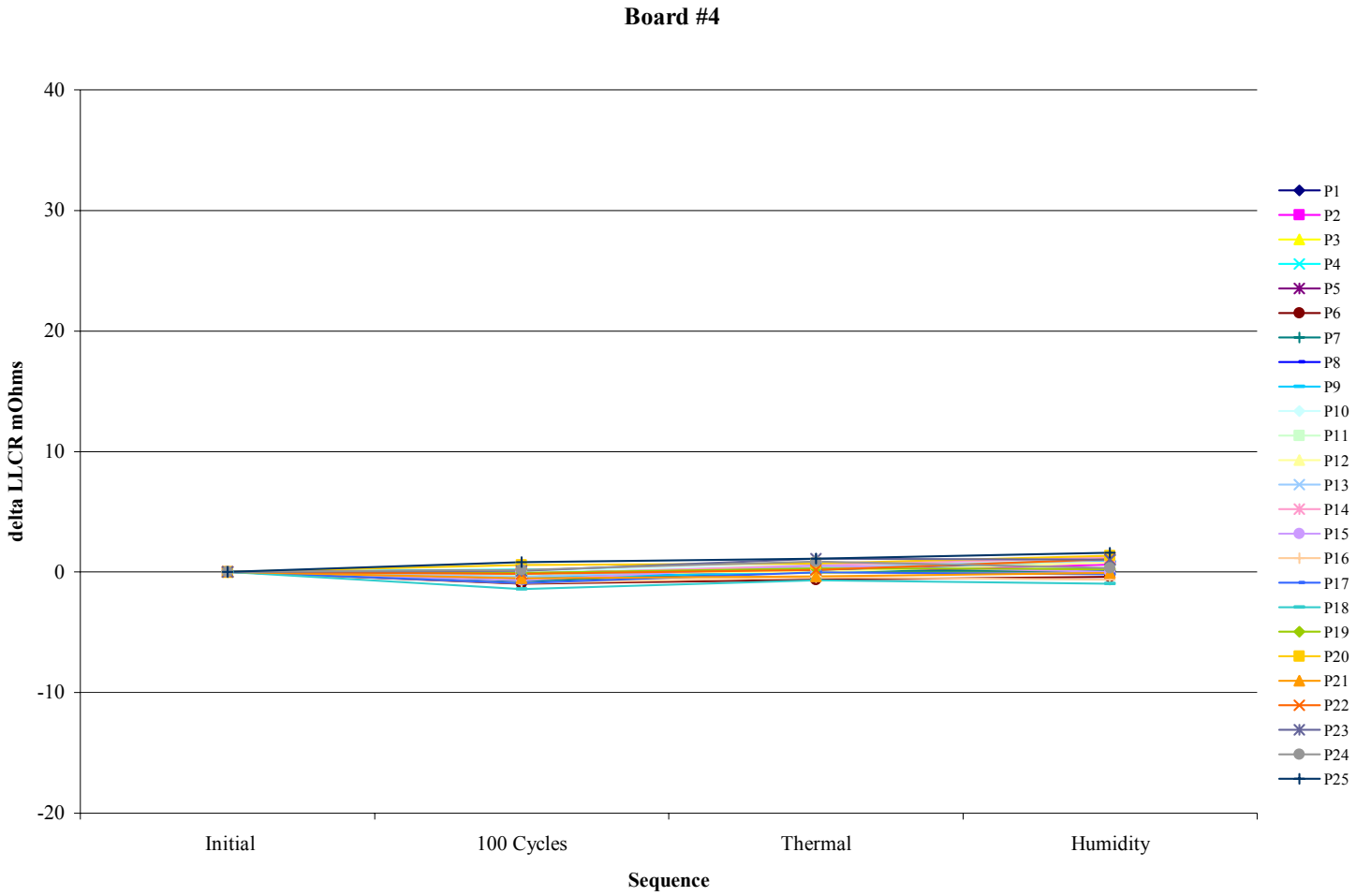
DATA SUMMARIES Continued

Board #3



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

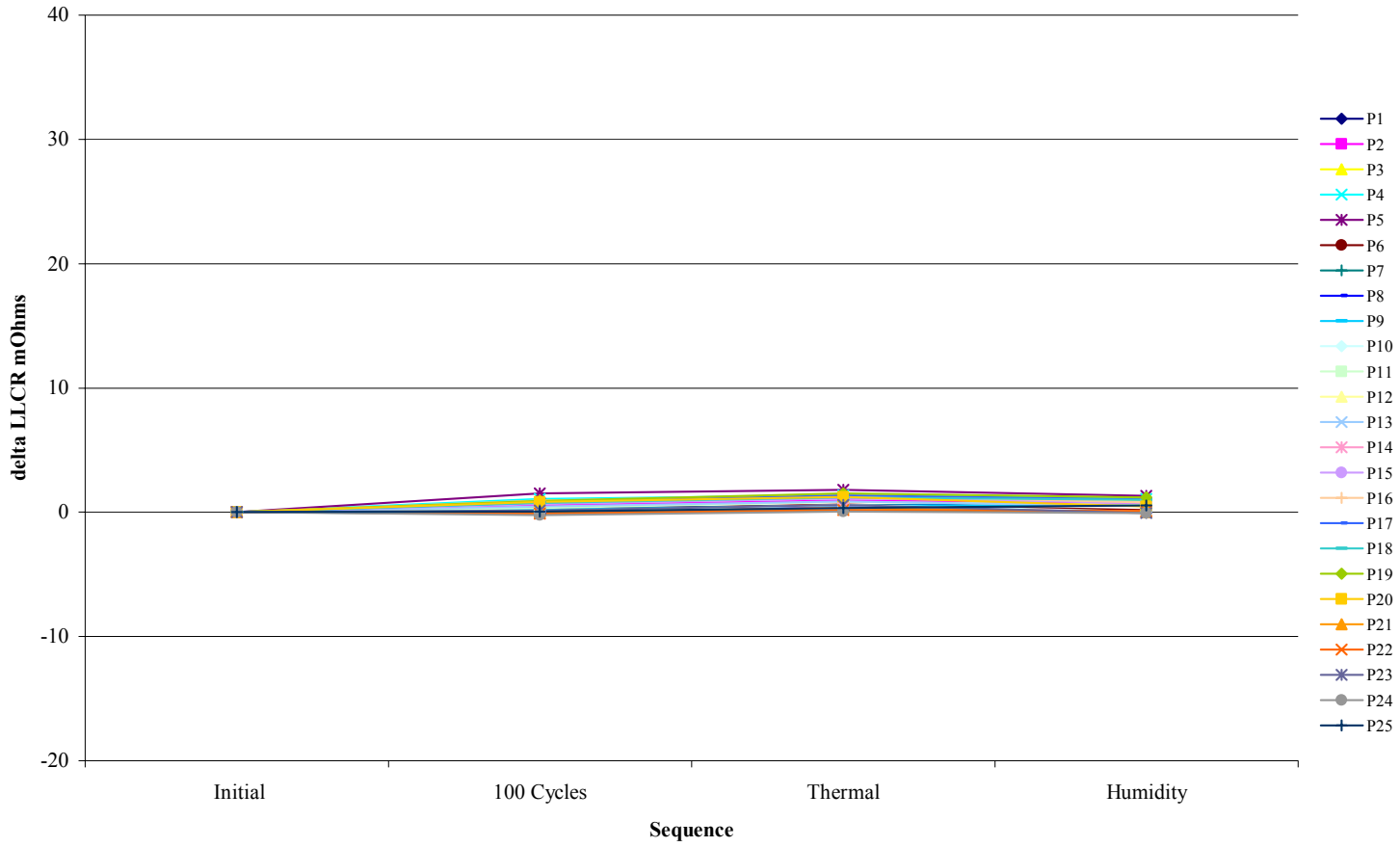
DATA SUMMARIES Continued



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES Continued

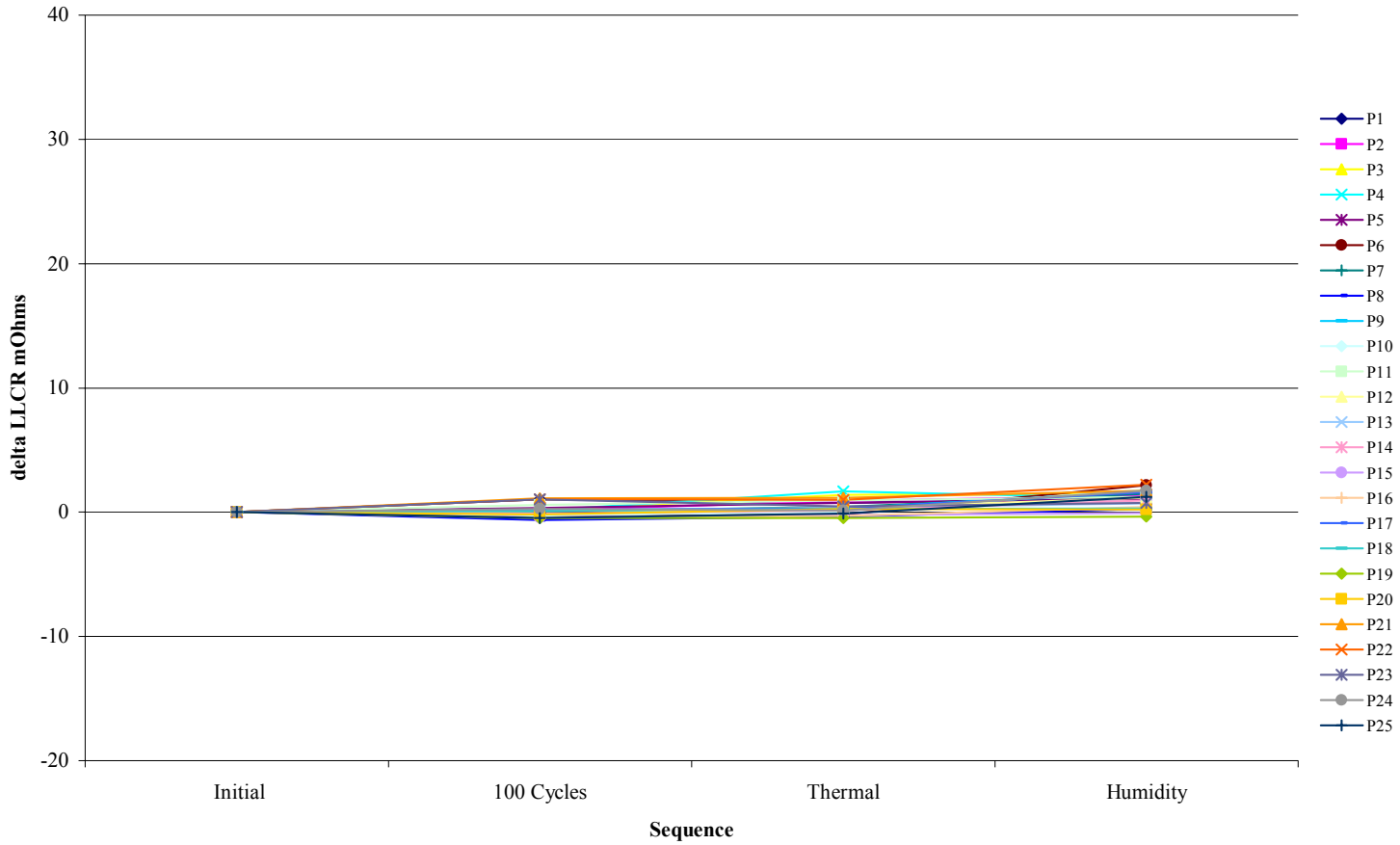
Board #5



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES Continued

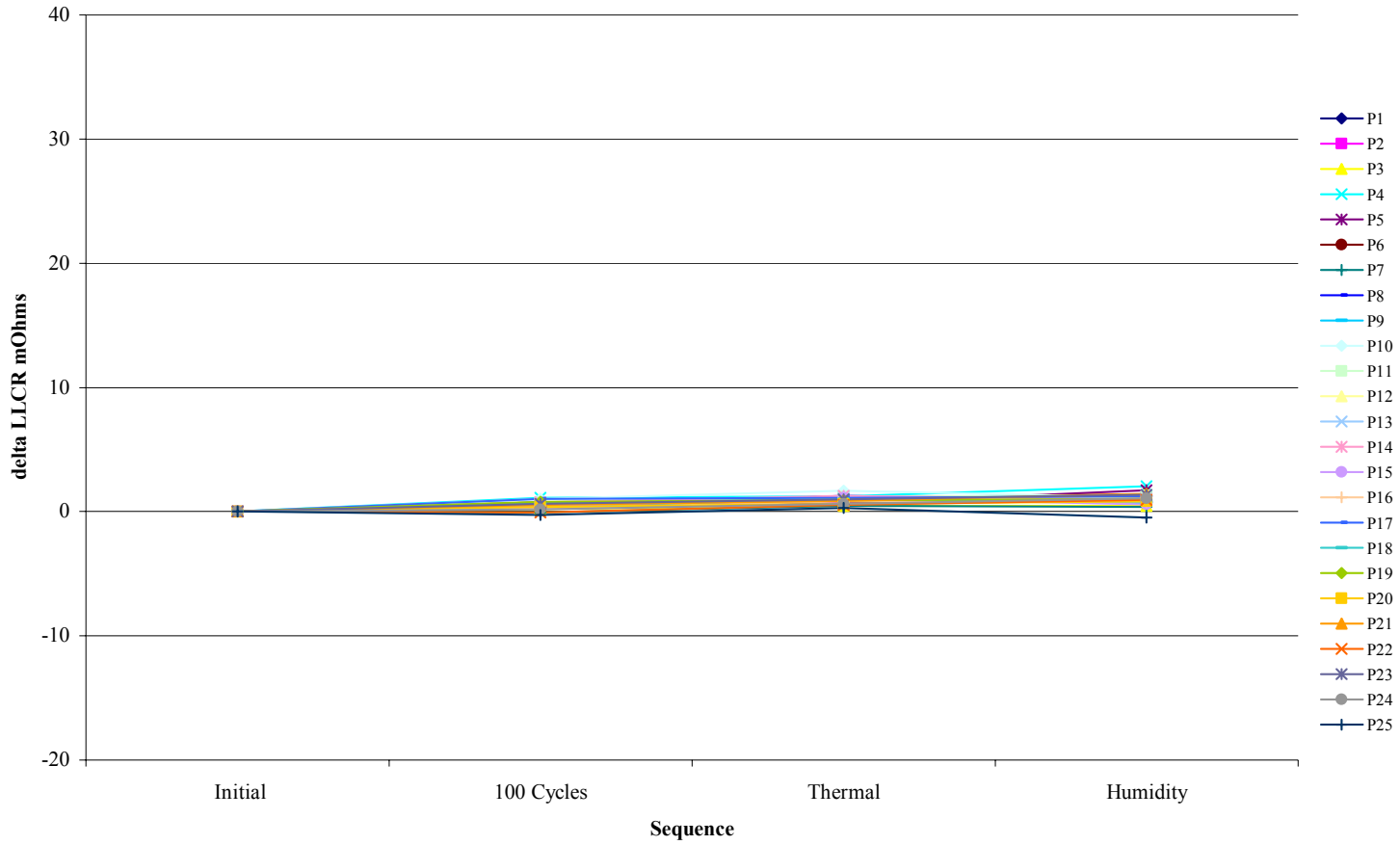
Board #6



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

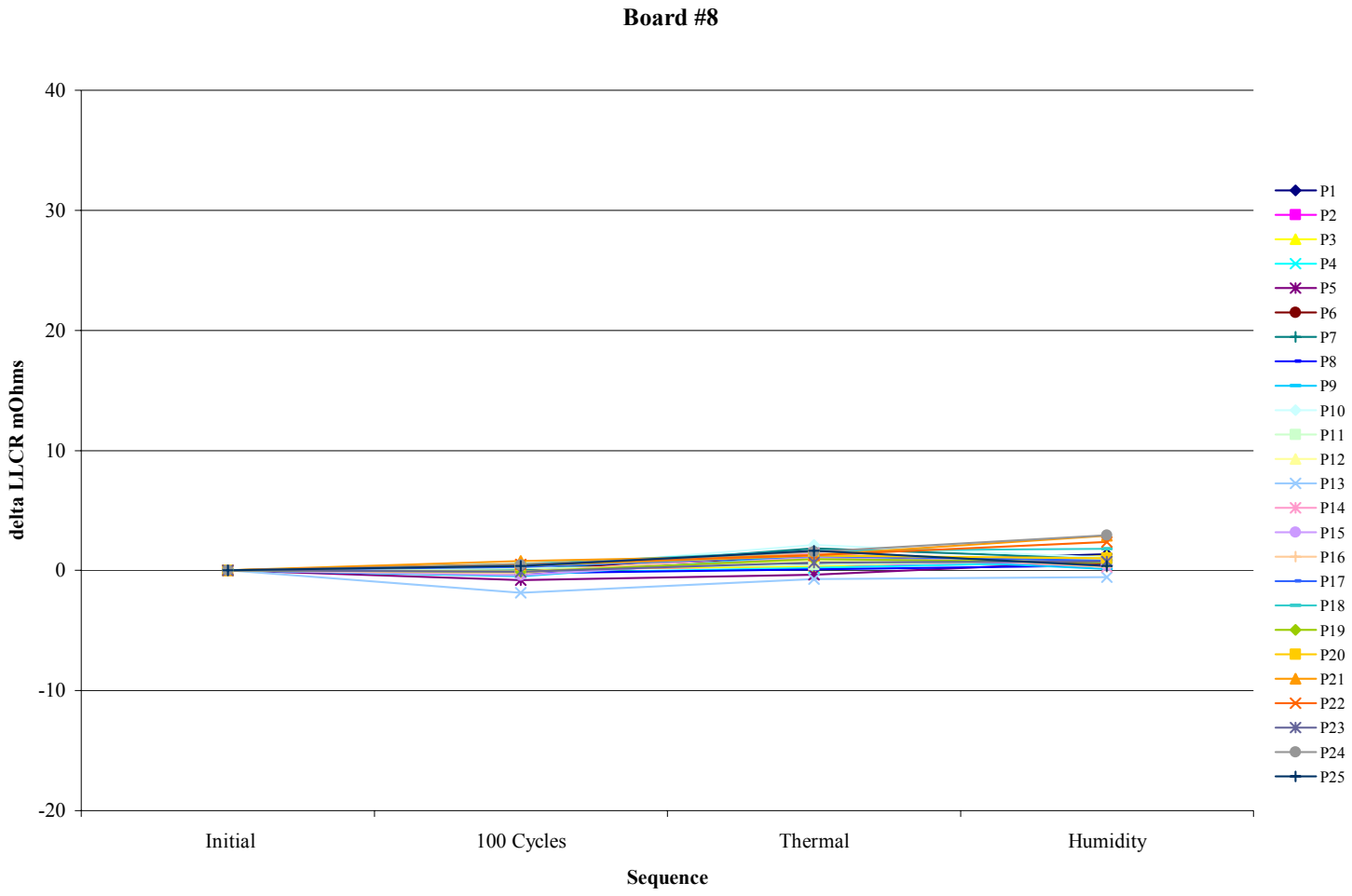
DATA SUMMARIES Continued

Board #7



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA SUMMARIES Continued



Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA

MATING/UNMATING – Stressing with the 0.056" Card:

Test Date:	3/25/2003
Operator:	Troy Cook
Temperature (C):	23
Humidity (RH):	34%
Equipment ID:	TCT-02
Load Cell ID:	LC-500N
Part #	MEC8-EM

		Initial				After 100 Cycles			
		Mating		**Unmating**		**Mating**		**Unmating**	
Sample#	Board Thick	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
1	**0.0595**	107.5	6.716	62.1	3.881	135.6	8.478	76.3	4.767
2	**0.0580**	76.7	4.791	48.6	3.036	131.7	8.233	57.8	3.612
3	**0.0600**	108.0	6.748	58.2	3.640	130.2	8.137	59.3	3.707
4	**0.0580**	89.6	5.597	57.6	3.597	133.2	8.328	62.4	3.899
5	**0.0600**	140.5	8.781	67.0	4.185	144.5	9.030	69.5	4.343
6	**0.0580**	87.7	5.482	50.5	3.154	136.4	8.522	54.9	3.433
7	**0.0585**	82.2	5.136	54.2	3.390	96.7	6.045	50.1	3.134
8	**0.0600**	92.8	5.803	54.9	3.433	105.7	6.604	54.8	3.425
9	**0.0595**	96.1	6.004	53.9	3.367	123.9	7.746	55.3	3.454
10	**0.0580**	83.0	5.185	54.4	3.403	126.0	7.872	57.3	3.579

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA Continued

MATING/UNMATING – Stressing with the 0.068" Card:

Test Date:	3/25/2003
Operator:	Troy Cook
Temperature (C):	22
Humidity (RH):	34%
Equipment ID:	TCT-02
Load Cell ID:	LC-500N
Part #	MEC8-EM

		Initial				After 100 Cycles			
		Mating		**Unmating**		**Mating**		**Unmating**	
Sample#	Board Thick	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
1	**0.0655**	138.8	8.672	125.1	7.821	162.2	10.140	158.8	9.922
2	**0.0665**	169.0	10.560	136.9	8.555	180.5	11.280	139.3	8.707
3	**0.0665**	134.3	8.394	126.5	7.904	172.5	10.780	172.5	10.780
4	**0.0670**	158.1	9.884	143.4	8.964	212.8	13.300	201.3	12.580
5	**0.0660**	146.4	9.149	129.4	8.090	210.9	13.180	190.7	11.920
6	**0.0660**	147.6	9.227	131.9	8.242	190.6	11.910	175.8	10.990
7	**0.0665**	136.8	8.549	103.1	6.442	159.4	9.964	126.4	7.899
8	**0.0660**	134.2	8.388	129.4	8.090	181.9	11.370	177.0	11.060
9	**0.0655**	135.5	8.469	116.8	7.299	158.0	9.872	137.9	8.621
10	**0.0660**	131.6	8.227	92.8	5.797	157.9	9.866	123.9	7.746

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

DATA Continued

LLCR:

	Mar. 21 2003	Apr. 07 2003	Apr. 07 2003	Apr. 22 2003
Date				
Room Temp C	20	20	21	20
RH	50%	43%	45%	46%
Name	Troy Cook	Troy Cook	Troy Cook	Troy Cook

mOhm values		Actual	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	Thermal	Humidity
1	P1	17.2	-0.3	0.1	0.9
1	P2	17.1	-0.6	-0.2	0.4
1	P3	17.1	-0.3	0.1	0.5
1	P4	17.2	-0.5	-0.2	1.2
1	P5	17.0	-0.2	0.1	0.4
1	P6	16.8	0.5	1.1	1.0
1	P7	17.3	-0.3	0.1	1.6
1	P8	16.8	0.3	1.0	0.7
1	P9	17.1	-0.7	-0.3	-0.5
1	P10	16.4	0.2	0.6	0.7
1	P11	16.6	0.3	0.4	1.4
1	P12	16.8	0.0	0.7	0.5
1	P13	16.8	-0.1	0.2	0.2
1	P14	16.8	0.1	0.5	3.6
1	P15	16.3	0.5	1.1	3.3
1	P16	16.4	0.5	1.0	2.5
1	P17	16.7	0.4	0.9	3.7
1	P18	16.5	0.8	1.4	2.3
1	P19	17.3	-0.5	0.0	1.5
1	P20	16.6	0.7	1.0	3.3
1	P21	17.1	0.0	0.4	1.1
1	P22	16.9	0.2	0.4	0.2
1	P23	16.9	0.1	0.5	0.2
1	P24	16.8	0.8	1.1	1.2
1	P25	16.6	1.0	1.6	1.3
2	P1	17.5	0.2	0.1	2.0
2	P2	17.1	0.2	0.1	0.6
2	P3	17.1	0.4	0.3	0.3
2	P4	16.8	0.5	0.4	0.5
2	P5	16.8	0.5	0.6	0.6
2	P6	17.3	-0.2	-0.2	0.2
2	P7	17.0	0.2	0.2	0.5
2	P8	17.0	0.1	0.1	0.2
2	P9	16.4	0.5	0.6	0.6
2	P10	16.7	0.6	0.9	0.9
2	P11	16.8	0.1	0.3	0.4

Tracking Code: TC0311-MEC8-EM-02-0158	Part #: MEC8-130-02-L-DEM2
Part description: MEC8-EM-02	

2	P12	17.0	-0.2	0.1	0.0
2	P13	16.7	0.5	0.6	1.2
2	P14	16.8	0.2	0.6	0.8
2	P15	16.8	0.0	0.4	0.5
2	P16	17.3	-0.6	-0.1	-0.2
2	P17	16.7	-0.1	0.3	0.4
2	P18	17.1	0.0	0.3	0.5
2	P19	16.9	0.3	0.6	0.8
2	P20	16.9	0.6	0.8	1.0
2	P21	17.9	-1.2	-0.9	-0.8
2	P22	17.7	-1.0	-0.6	-0.4
2	P23	17.7	-0.8	-0.6	-0.6
2	P24	17.4	-0.2	-0.2	0.2
2	P25	17.9	-0.4	-0.3	1.0
3	P1	17.3	0.1	0.1	0.5
3	P2	17.2	0.0	0.0	0.4
3	P3	18.0	-1.0	-0.7	-0.7
3	P4	17.9	-0.9	-0.6	-0.5
3	P5	18.3	-0.7	-0.5	-0.5
3	P6	17.3	-0.5	-0.1	-0.2
3	P7	16.8	-0.1	0.3	0.3
3	P8	17.3	-0.4	0.0	-0.1
3	P9	16.8	-0.4	0.2	-0.1
3	P10	17.5	-0.5	0.0	-0.3
3	P11	17.2	-0.2	0.5	0.1
3	P12	17.2	-0.8	-0.3	-0.4
3	P13	17.1	-0.4	0.1	-0.1
3	P14	16.7	0.2	0.6	0.7
3	P15	18.3	-1.7	-1.1	-1.3
3	P16	17.9	-1.7	-1.0	-1.1
3	P17	16.7	-0.2	0.1	0.0
3	P18	17.2	-0.1	0.4	0.2
3	P19	16.9	-0.3	0.2	0.1
3	P20	16.9	0.4	0.7	0.8
3	P21	19.0	-1.5	-1.4	-1.0
3	P22	18.4	-1.1	-0.9	-0.7
3	P23	17.9	-0.8	-0.5	-0.5
3	P24	17.7	-0.8	-0.6	0.3
3	P25	17.0	0.3	0.5	0.8
4	P1	18.0	-0.3	0.2	0.1
4	P2	17.5	0.0	0.0	0.6
4	P3	17.6	-0.2	-0.1	0.2
4	P4	17.5	0.2	0.2	1.0
4	P5	17.8	0.1	0.0	1.0
4	P6	17.9	-1.0	-0.6	-0.4
4	P7	17.8	-0.8	0.1	0.1
4	P8	17.6	-0.5	0.0	0.8
4	P9	17.4	-0.5	0.0	0.9
4	P10	17.1	0.1	0.6	1.1
4	P11	17.5	-0.3	0.6	0.8

4	P12	18.1	-0.1	0.0	0.8
4	P13	17.5	-0.4	0.4	1.0
4	P14	17.7	-0.2	0.5	1.2
4	P15	17.8	-0.7	0.5	0.0
4	P16	17.9	-0.9	-0.4	-0.6
4	P17	18.0	-0.9	0.0	-0.2
4	P18	18.9	-1.4	-0.7	-1.0
4	P19	17.6	-0.1	0.3	0.3
4	P20	17.3	0.6	0.7	1.4
4	P21	18.4	-0.5	-0.4	-0.1
4	P22	17.9	-0.2	0.2	1.1
4	P23	17.3	0.1	1.1	1.0
4	P24	17.6	0.2	0.9	0.3
4	P25	17.6	0.8	1.1	1.6
5	P1	17.0	0.3	0.5	1.0
5	P2	16.7	0.5	1.0	0.8
5	P3	16.7	0.8	1.1	0.9
5	P4	16.5	1.1	1.4	1.1
5	P5	16.5	1.5	1.8	1.3
5	P6	17.1	0.2	0.6	0.2
5	P7	17.3	-0.2	0.1	0.0
5	P8	17.2	0.0	0.4	0.0
5	P9	16.9	0.2	0.6	0.6
5	P10	17.1	0.0	0.6	0.1
5	P11	16.9	0.4	0.8	0.6
5	P12	16.5	0.7	1.3	0.8
5	P13	16.5	0.5	0.9	0.5
5	P14	16.8	-0.1	0.4	0.0
5	P15	16.7	0.7	1.1	0.7
5	P16	16.7	0.9	1.4	0.8
5	P17	16.6	0.8	1.3	1.0
5	P18	16.3	0.8	1.2	1.0
5	P19	16.5	0.9	1.5	1.2
5	P20	16.9	0.8	1.2	0.4
5	P21	16.8	0.0	0.3	0.0
5	P22	16.8	-0.1	0.2	0.1
5	P23	16.9	0.1	0.6	-0.1
5	P24	17.0	-0.2	0.1	-0.1
5	P25	17.4	0.0	0.3	0.5
6	P1	17.7	1.0	0.7	1.1
6	P2	17.5	0.1	0.9	1.3
6	P3	17.6	0.2	1.4	1.5
6	P4	17.5	0.1	1.7	1.1
6	P5	17.6	0.4	0.8	1.1
6	P6	17.5	-0.3	-0.2	2.2
6	P7	17.2	0.0	0.4	1.5
6	P8	17.7	-0.6	-0.3	0.3
6	P9	17.0	0.2	0.3	1.7
6	P10	17.3	-0.3	0.1	1.8
6	P11	17.2	0.6	1.0	1.2

6	P12	16.8	0.1	0.3	1.2
6	P13	17.0	0.1	0.3	0.7
6	P14	17.0	-0.1	0.1	0.9
6	P15	17.5	-0.4	-0.2	0.0
6	P16	17.6	-0.5	-0.3	0.4
6	P17	16.8	0.2	0.3	1.6
6	P18	17.3	0.1	0.3	0.3
6	P19	17.7	-0.5	-0.5	-0.3
6	P20	17.5	-0.2	0.2	0.2
6	P21	17.6	1.1	1.2	1.7
6	P22	17.5	1.0	1.0	2.2
6	P23	17.6	1.1	0.5	0.7
6	P24	18.1	0.3	0.1	1.7
6	P25	18.4	-0.5	-0.1	1.2
7	P1	17.2	0.7	0.8	1.2
7	P2	17.3	0.6	0.8	0.9
7	P3	17.1	0.2	0.4	0.4
7	P4	16.5	1.1	1.2	2.0
7	P5	17.0	0.5	0.6	1.7
7	P6	17.0	0.5	1.1	1.4
7	P7	17.3	0.0	0.5	0.4
7	P8	17.0	0.3	1.3	0.7
7	P9	17.1	0.3	1.0	0.7
7	P10	16.5	1.0	1.7	1.2
7	P11	16.5	0.8	1.2	1.3
7	P12	16.6	0.6	1.1	1.1
7	P13	17.0	0.8	1.1	1.0
7	P14	16.5	0.7	1.3	1.0
7	P15	16.7	0.4	1.1	0.6
7	P16	16.8	0.3	0.8	0.8
7	P17	16.7	1.0	1.1	1.2
7	P18	16.9	0.7	1.0	0.9
7	P19	16.7	0.8	0.9	1.0
7	P20	17.1	0.4	0.6	0.8
7	P21	16.9	0.5	0.9	1.4
7	P22	17.1	-0.1	0.5	0.9
7	P23	16.9	0.6	1.0	1.4
7	P24	17.5	0.2	0.6	1.1
7	P25	17.7	-0.3	0.3	-0.5
8	P1	16.9	0.0	0.6	1.4
8	P2	16.7	0.1	0.4	0.8
8	P3	16.5	0.1	0.3	1.2
8	P4	16.9	-0.2	0.2	0.7
8	P5	17.4	-0.8	-0.3	0.8
8	P6	16.5	0.1	1.2	0.5
8	P7	16.7	0.1	1.9	1.0
8	P8	16.8	-0.2	0.1	0.4
8	P9	17.0	-0.5	1.2	0.1
8	P10	16.5	0.2	2.1	1.1
8	P11	16.5	0.2	0.5	0.8

8	P12	16.7	0.0	0.8	0.9
8	P13	18.6	-1.8	-0.7	-0.6
8	P14	16.9	-0.2	1.5	0.3
8	P15	16.8	-0.4	1.1	0.4
8	P16	16.6	-0.2	1.6	0.3
8	P17	16.4	0.3	1.2	0.8
8	P18	16.4	0.5	1.7	1.8
8	P19	16.8	-0.1	0.9	0.7
8	P20	16.5	0.4	1.2	1.0
8	P21	16.6	0.8	1.3	2.9
8	P22	16.4	0.5	1.3	2.4
8	P23	16.5	-0.1	0.7	0.8
8	P24	16.7	0.5	1.5	2.9
8	P25	16.7	0.4	1.7	0.4

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: THL-01
Description: Temperature/Humidity Chart Recorder
Manufacturer: Dickson
Model: THDX
Serial #: 9316255
Accuracy: Temp: +/- 1C; Humidity: +/-2% RH (0 - 60%) +/- 3% RH (61 - 95%).
… Last Cal: 7/15/02, Next Cal: 7/15/03

Equipment #: TCT-02
Description: Dillon Quantrol TC2 Test Stand
Manufacturer: Dillon
Model: PCM
Serial #: 280769
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 8/15/01, Next Cal: 8/31/03

Equipment #: TCT-03
Description: Dillon Quantrol TC2 Test Stand
Manufacturer: Dillon Quantrol
Model: TC2
Serial #: 02-1033-03
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Displacement: +/- 5 micrometers.
… Last Cal: 8/15/01, Next Cal: 8/31/03

Equipment #: LC-25N
Description: 25 N Load Cell
Manufacturer: Dillon
Model: TC2 Load Cell
Serial #: 5373
Accuracy: See Manual
… Last Cal: 8/22/02, Next Cal: 8/22/03

Equipment #: LC-2500N(icell)
Description: 2500 N Load Cell for Dillon Quantrol
Manufacturer: Dillon Quantrol
Model: icell
Serial #: 01-0132-01
Accuracy: .10% of capacity
… Last Cal: 3/27/03, Next Cal: 3/27/04

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 Temp. Stability: +/-.1C/C change in ambient
… Last Cal: 6/25/02, Next Cal: 6/25/03

Equipment #: THC-02
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SE-1000-6-6
Serial #: 31808
Accuracy: See Manual
… Last Cal: 8/15/02, Next Cal: 8/15/03

Equipment #: MO-01
Description: Micro-Ohmeter
Manufacturer: Keithley
Model: 580
Serial #: 0772740
Accuracy: See Manual
… Last Cal: 6/25/02, Next Cal: 6/25/03

Equipment #: MO-03
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0791975
Accuracy: See Manual
… Last Cal: 6/25/02, Next Cal: 6/25/03

Equipment #: TC090601-103/105
Description: IC Thermocouple-103/105
Manufacturer: Samtec
Model:
Serial #: 9316255
Accuracy: +/- 1 degree C

Equipment #: MO-02
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0780546
Accuracy: See Manual
… Last Cal: 6/25/02, Next Cal: 6/25/03