Project Number: Design Verification Test	Tracking Code: TC0945—2881_Report_Rev_1		
Requested by: Brian Perry	Date: 3/30/2010	Product Rev: 1	
Part #: LSEM-150-01-L-DH-A-K-TR　　LSEM-150-06.0-F-DV-A-K-TR	Lot #: n/a	Tech: Gary Lomax　Tony Wagoner	Eng: Eric Mings　Mark Shireman
Part description: LSEM Connector			Qty to test: 100
Test Start: 11/18/2009	Test Completed: 12/28/2009		
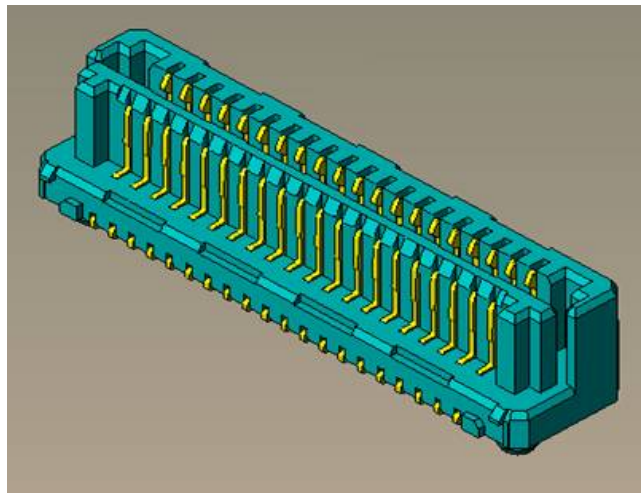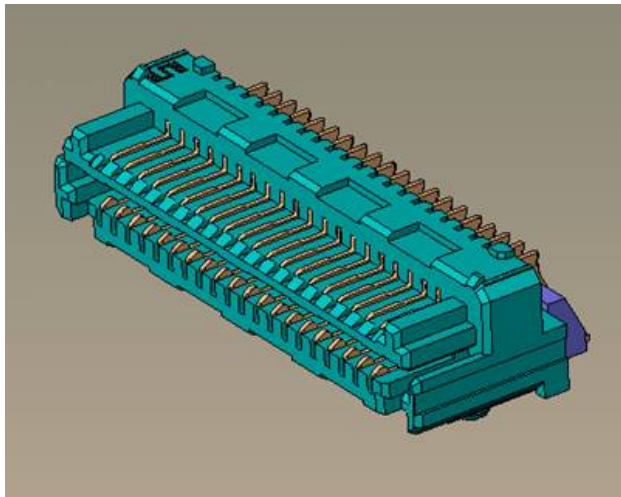
Design Verification Test Report

LSEM-150-01-L-DH-A-K-TR
LSEM-150-06.0-F-DV-K-TR

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 test. See test plan.

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-101853-TST/ PCB-101852-TST

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)

Kester Lead Free Reflow Profile
Alloys: Sn96.5/Ag3.0/Cu0.5 and Sn96.5/Ag3.5
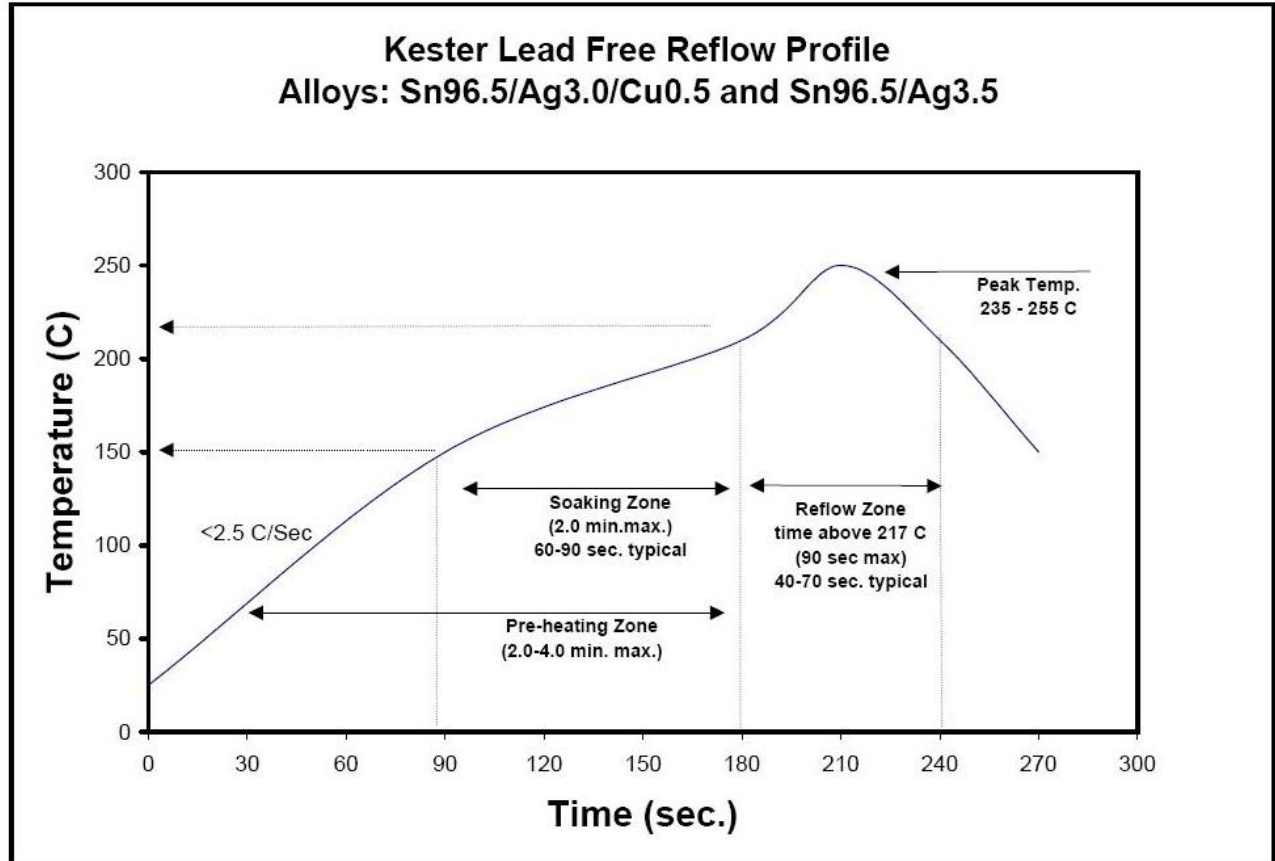
FLOWCHARTS

Mating/Unmating/Gaps

TEST STEP	GROUP A 10 Boards
01	Contact Gaps
02	Mating / Unmating
03	25 Cycles
04	Clean w/Compressed Air
05	Mating / Unmating
06	25 Cycles (50 Total)
07	Clean w/Compressed Air
08	Mating / Unmating
09	25 Cycles (75 Total)
10	Clean w/Compressed Air
11	Mating / Unmating
12	25 Cycles (100 Total)
13	Clean w/Compressed Air
14	Mating / Unmating
15	Contact Gaps
16	Thermal Aging (Mated)
17	Mating / Unmating
18	Contact Gaps
19	Cyclic Humidity (Mated)
20	Mating / Unmating

Thermal Aging = EIA-364-17, Test Condition 4 (105 °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

IR & DWV

TEST STEP	GROUP A1 2 Mated Sets Break Down - Pin to Pin	GROUP A2 2 Unmated of Part # Being Tested Break Down - Pin to Pin	GROUP A3 2 Unmated of Mating Part # Break Down - Pin to Pin	GROUP B 2 Mated Sets Pin to Pin
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Aging (both sets unmated)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (both sets unmated)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

* - DWV on group B to be performed at Test Voltage

  DWV test voltage is equal to 75% of the lowest break down voltage from group A1, A2 or A3

Thermal Aging = EIA-364-17, Test Condition 4 (105 °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, Test Condition 1

Current Carrying Capacity

TEST STEP	GROUP A 3 Mated Assemblies 2 CONTACT POWERED	GROUP B 3 Mated Assemblies 4 CONTACTS POWERED	GROUP C 3 Mated Assemblies 6 CONTACTS POWERED	GROUP D 3 Mated Assemblies 8 CONTACTS POWERED	GROUP E 3 Mated Assemblies ALL CONTACTS POWERED
01	CCC	CCC	CCC	CCC	CCC

(TIN PLATING) - Tabulate calculated current at RT, 65° C, 75° C and 95° C

  after derating 20% and based on 105° C

(GOLD PLATING) - Tabulate calculated current at RT, 85° C, 95° C and 115° C

  after derating 20% and based on 125° C

CCC, Temp rise = EIA-364-70

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.

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. 80° C
    c. 95° C
    d. 115° 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.

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.

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. Barometric Test Condition 1
      iii. Rate of Application 500 V/Sec
      iv. 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

Temperature Rise, CCC at a 20% de-rating
- **CCC for a 30°C Temperature Rise ------------------------1.8A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ------------------------1.4A per contact with 4 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ------------------------1.2A per contact with 6 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ------------------------1.1A per contact with 8 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise ------------------------0.5A per contact with all adjacent contacts powered**

Contact Gaps

LSEM DH
- **Initial**
  - **Min--- 0.5700 mm**
  - **Max --- 0.6740 mm**
- **After 100 Cycles**
  - **Min--- 0.5820 mm**
  - **Max --- 0.6860 mm**
- **Thermal**
  - **Min--- 0.6441 mm**
  - **Max --- 0.7261 mm**

LSEM DV
- **Initial**
  - **Min--- 0.5560 mm**
  - **Max --- 0.6460 mm**
- **After 100 Cycles**
  - **Min--- 0.5710 mm**
  - **Max --- 0.6600 mm**
- **Thermal**
  - **Min--- 0.6201 mm**
  - **Max --- 0.6881 mm**

Mating – Unmating Forces
- **Initial**
  - **Mating**
    - **Min -------------------------------------21.12 Lbs**
    - **Max--------------------------------------34.59 Lbs**
  - **Unmating**
    - **Min -------------------------------------14.12 Lbs**
    - **Max--------------------------------------25.35 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min -------------------------------------18.83 Lbs**
    - **Max--------------------------------------21.98 Lbs**
  - **Unmating**
    - **Min -------------------------------------17.06 Lbs**
    - **Max--------------------------------------24.07 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min -------------------------------------18.86 Lbs**
    - **Max--------------------------------------23.37 Lbs**
  - **Unmating**
    - **Min -------------------------------------14.49 Lbs**
    - **Max--------------------------------------25.15 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min -------------------------------------19.35 Lbs**
    - **Max--------------------------------------24.79 Lbs**
  - **Unmating**
    - **Min -------------------------------------15.96 Lbs**
    - **Max--------------------------------------26.46 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min -------------------------------------18.73 Lbs**
    - **Max--------------------------------------26.37 Lbs**
  - **Unmating**
    - **Min -------------------------------------16.32 Lbs**
    - **Max--------------------------------------26.84 Lbs**
- **Thermal**
  - **Mating**
    - **Min -------------------------------------12.27 Lbs**
    - **Max--------------------------------------14.50 Lbs**
  - **Unmating**
    - **Min -------------------------------------13.83 Lbs**
    - **Max--------------------------------------16.14 Lbs**
- **Humidity**
  - **Mating**
    - **Min -------------------------------------11.69 Lbs**
    - **Max--------------------------------------13.67 Lbs**
  - **Unmating**
    - **Min -------------------------------------11.15 Lbs**
    - **Max--------------------------------------15.94 Lbs**

Insulation Resistance minimums, IR
- **Initial**
  - **Mated**-- **100000 Meg Ω** ---------------------- **Pass**
  - **Unmated** -- **100000 Meg Ω** ---------------------- **Pass**
- **Thermal**
  - **Mated**-- **100000 Meg Ω** ---------------------- **Pass**
  - **Unmated** -- **100000 Meg Ω** -------------------- **Pass**
- **Humidity**
  - **Mated**-- **100000 Meg Ω** -------------------- **Pass**
  - **Unmated** -- **100000 Meg Ω** -------------------- **Pass**

Dielectric Withstanding Voltage minimums, DWV
- **Minimums**
  - **Breakdown Voltage**---------------------------------**900VAC**
  - **Test Voltage** ---**675VAC**
  - **Working Voltage** -------------------------------------**225VAC**
- **Initial DWV** ---**Passed**
- **Thermal DWV**---**Passed**
- **Humidity DWV**--**Passed**

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) Adjacent contacts were powered:

      a. Linear configuration with 2 adjacent conductors/contacts powered

TC0945--2881
2 (2x1) Contacts in Series
Part Numbers: LSEM-150-06.0-F-DV-A-K-TR / LSEM-150-01-L-DH-A-K-TR

Current Rating per Contact (30 Deg. Rise, 20% Derated) = 1.8 Amps
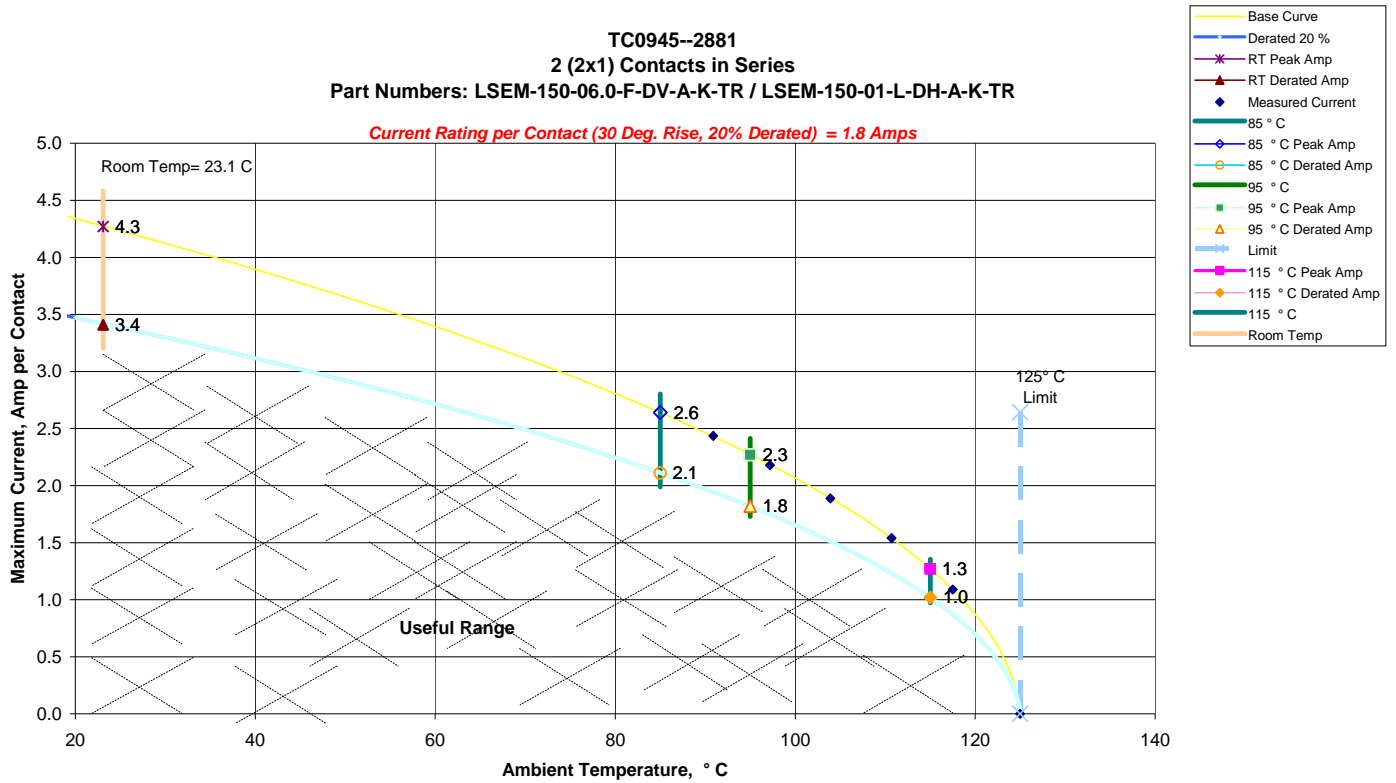
b. Linear configuration with 4 adjacent conductors/contacts powered

TC0945--2881
4 (2x2) Contacts in Series
Part Numbers: LSEM-150-06.0-F-DV-A-K-TR / LSEM-150-01-L-DH-A-K-TR

Current Rating per Contact (30 Deg. Rise, 20% Derated) = 1.4 Amps
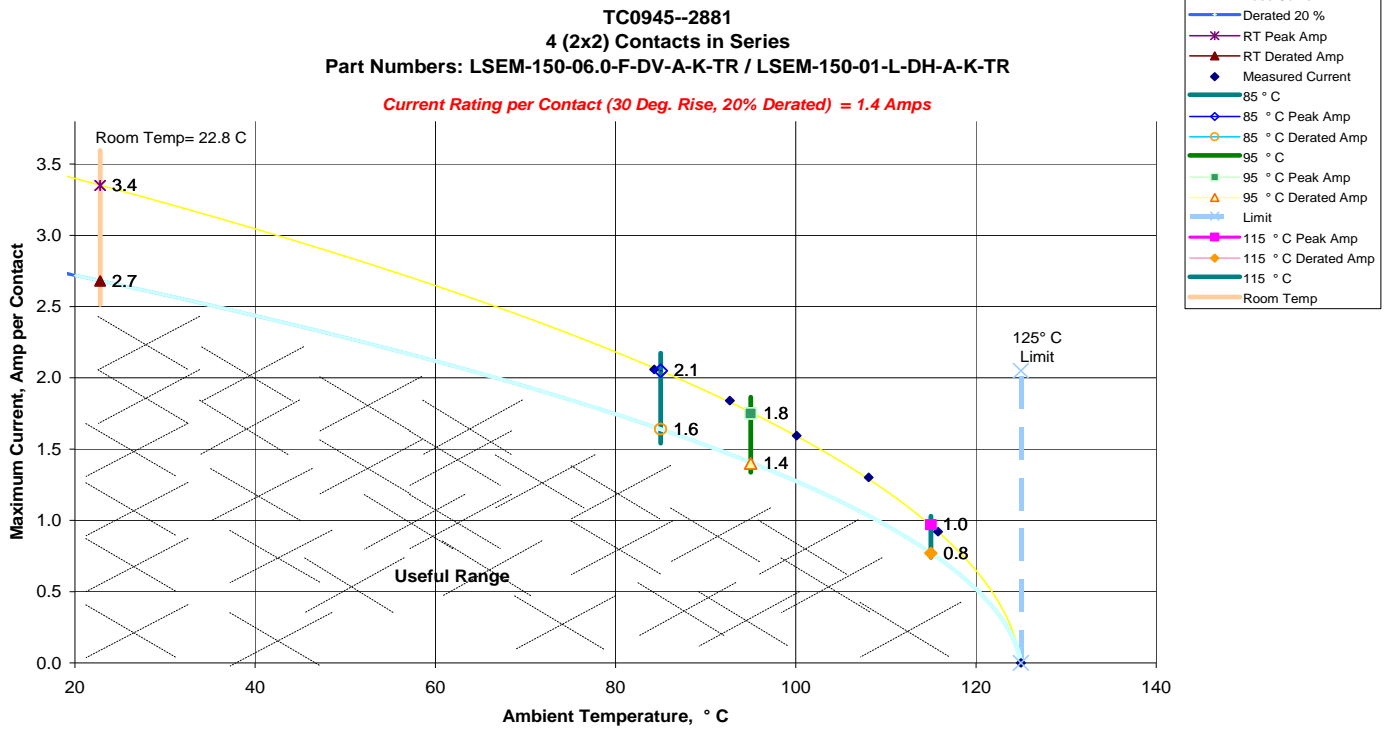
c. Linear configuration with 6 adjacent conductors/contacts powered

TC0945--2881
6 (2x3) Contacts in Series
Part Numbers: LSEM-150-06.0-F-DV-A-K-TR / LSEM-150-01-L-DH-A-K-TR

Current Rating per Contact (30 Deg. Rise, 20% Derated) = 1.2 Amps
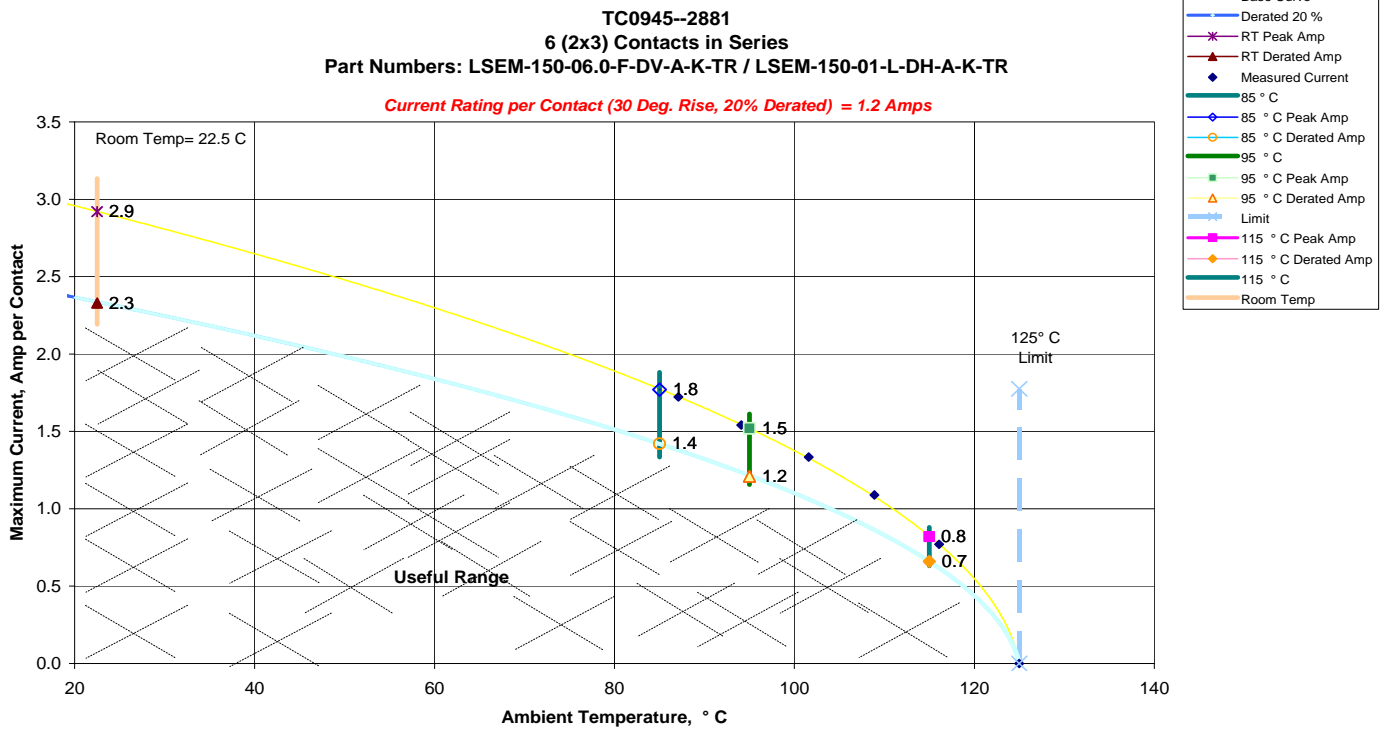
d.   Linear configuration with 8 adjacent conductors/contacts powered

TC0945--2881
8 (2x4) Contacts in Series
Part Numbers: LSEM-150-06.0-F-DV-A-K-TR / LSEM-150-01-L-DH-A-K-TR
Current Rating per Contact (30 Deg. Rise, 20% Derated) = 1.1 Amps
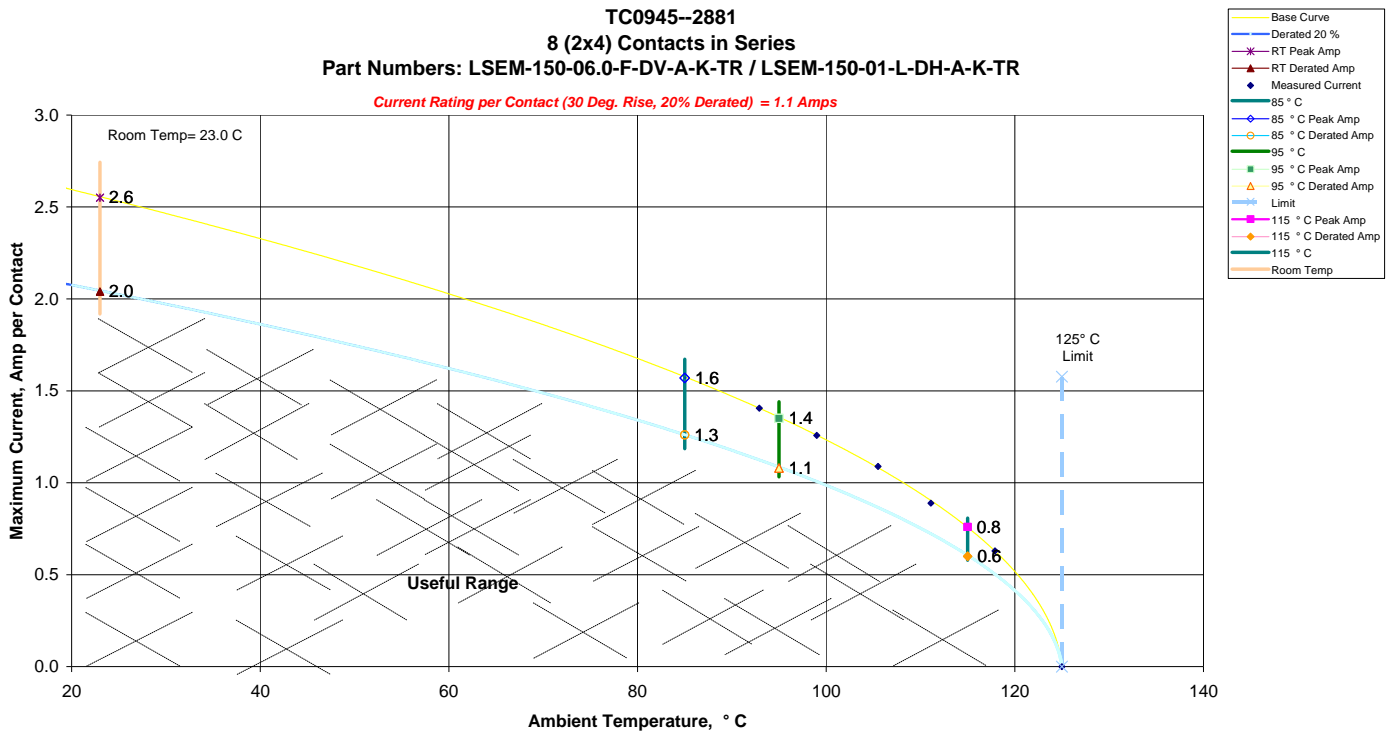
e.   Linear configuration with all adjacent conductors/contacts powered

TC0945--2881
100 (All Power) Contacts in Series
Part Numbers: LSEM-150-06.0-F-DV-A-K-TR / LSEM-150-01-L-DH-A-K-TR
Current Rating per Contact (30 Deg. Rise, 20% Derated) = 0.5 Amps
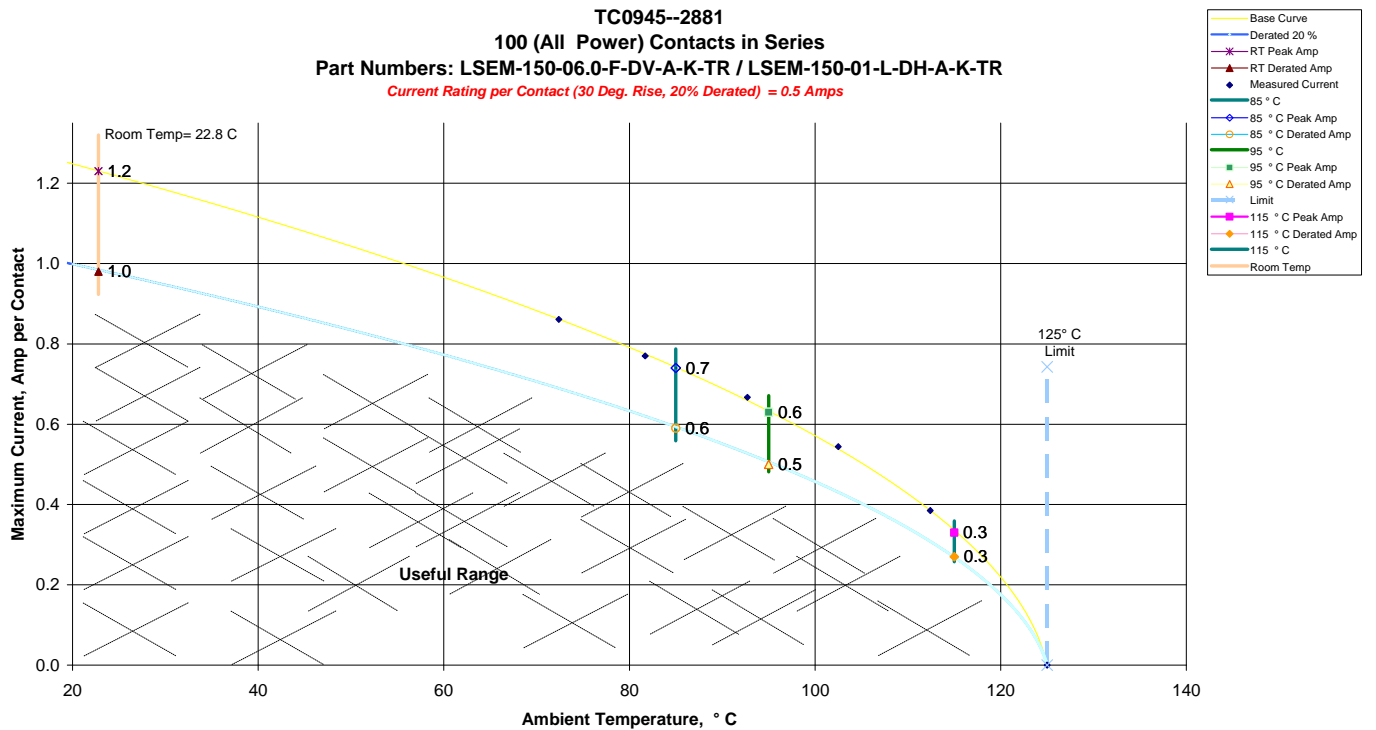
CONTACT GAPS:

LSEM-DH:

Initial		After 100 Cycles		After Thermal	
Units:	mm	Units:	mm	Units:	mm
Minimum	0.5700	*Minimum*	0.5820	*Minimum*	0.6441
Maximum	0.6740	*Maximum*	0.6860	*Maximum*	0.7261
Average	0.5971	*Average*	0.6206	*Average*	0.6793
St. Dev.	0.0221	*St. Dev.*	0.0204	*St. Dev.*	0.0147
Count	250	*Count*	250	*Count*	250

LSEM-DV:

Initial		After 100 Cycles		After Thermal	
Units:	mm	Units:	mm	Units:	mm
Minimum	0.5560	*Minimum*	0.5710	*Minimum*	0.6201
Maximum	0.6460	*Maximum*	0.6600	*Maximum*	0.6881
Average	0.5873	*Average*	0.6018	*Average*	0.6539
St. Dev.	0.0165	*St. Dev.*	0.0144	*St. Dev.*	0.0104
Count	250	*Count*	250	*Count*	250

MATING/UNMATING:

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	93.96	21.12	62.80	14.12	83.74	18.83	75.89	17.06
Maximum	153.86	34.59	112.75	25.35	97.78	21.98	107.07	24.07
Average	110.19	**24.77**	95.97	**21.58**	91.01	**20.46**	92.73	**20.85**
St Dev	17.22	3.87	16.90	3.80	3.55	0.80	9.31	2.09
Count	10	10	10	10	10	10	10	10

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	83.88	18.86	64.46	14.49	86.07	19.35	70.99	15.96
Maximum	103.93	23.37	111.85	25.15	110.27	24.79	117.71	26.46
Average	92.28	**20.75**	91.60	**20.59**	95.95	**21.57**	94.81	**21.32**
St Dev	6.51	1.46	14.20	3.19	7.65	1.72	17.45	3.92
Count	10	10	10	10	10	10	10	10

	After 100 Cycles				After Thermals			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	83.33	18.73	72.57	16.32	54.59	12.27	61.50	13.83
Maximum	117.09	26.33	119.39	26.84	64.48	14.50	71.78	16.14
Average	101.15	**22.74**	102.99	**23.15**	59.38	**13.35**	67.27	**15.12**
St Dev	9.52	2.14	16.96	3.81	2.67	0.60	2.86	0.64
Count	10	10	10	10	10	10	10	10

	After Humidity			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	51.98	11.69	49.58	11.15
Maximum	60.79	13.67	70.91	15.94
Average	56.30	**12.66**	60.05	**13.50**
St Dev	2.95	0.66	7.39	1.66
Count	10	10	10	10

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
Initial	100000	100000	100000
Thermal	100000	100000	100000
Humidity	100000	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**LSEM-DV/LSEM-DH**
Break Down Voltage	900
Test Voltage	675
Working Voltage	225

Pin to Pin	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Part description: LSEM Connector

DATA

CONTACT GAPS:

LSEM DH:

Initial

Pos.#	B1	B2	B3	B4	B5
1	0.6720	0.6640	0.6480	0.6500	0.6480
2	0.6640	0.6600	0.6320	0.6440	0.6380
3	0.6560	0.6400	0.6280	0.6420	0.6280
4	0.6220	0.5880	0.5780	0.5880	0.5980
5	0.6220	0.6080	0.6000	0.6080	0.6160
6	0.6240	0.6100	0.5780	0.5880	0.5920
7	0.6060	0.5920	0.5760	0.5900	0.5880
8	0.6140	0.5980	0.5720	0.5940	0.5920
9	0.5980	0.5840	0.5720	0.5700	0.6020
10	0.6060	0.5960	0.5860	0.5860	0.5940
11	0.5920	0.5880	0.5800	0.5760	0.6040
12	0.5980	0.5940	0.5720	0.5740	0.5800
13	0.5920	0.6000	0.5710	0.5840	0.5840
14	0.5940	0.5760	0.5700	0.5720	0.5740
15	0.5940	0.5880	0.5820	0.5920	0.5940
16	0.6040	0.5880	0.5700	0.5800	0.5820
17	0.5960	0.5840	0.5710	0.5780	0.5800
18	0.5900	0.5780	0.5710	0.5820	0.5840
19	0.5960	0.5780	0.5720	0.5700	0.5760
20	0.6080	0.5880	0.5820	0.5800	0.6060
21	0.5960	0.5880	0.5740	0.5740	0.5820
22	0.6020	0.5800	0.5760	0.5840	0.5740
23	0.6080	0.5900	0.5740	0.5820	0.5880
24	0.5880	0.5740	0.5720	0.5720	0.5700
25	0.5960	0.5960	0.5900	0.5980	0.5920
26	0.6040	0.5840	0.5900	0.5740	0.5900
27	0.5920	0.5780	0.5860	0.5700	0.5740
28	0.5980	0.5860	0.5860	0.5800	0.5720
29	0.5840	0.5840	0.5820	0.5740	0.5860
30	0.6040	0.5960	0.5940	0.5840	0.5780
31	0.6040	0.5960	0.5840	0.5880	0.5820
32	0.6040	0.5940	0.5720	0.5860	0.5820
33	0.5980	0.5900	0.5880	0.6000	0.5860
34	0.6040	0.5840	0.5840	0.5800	0.5760
35	0.6160	0.6100	0.5980	0.6060	0.5880
36	0.6100	0.5940	0.5840	0.5980	0.5800
37	0.6020	0.5940	0.5840	0.5900	0.5760
38	0.6000	0.5920	0.5860	0.6100	0.5860
39	0.5960	0.5920	0.5800	0.5880	0.5820
30	0.6080	0.6040	0.5980	0.6060	0.5940
31	0.6060	0.6120	0.5940	0.6020	0.6000
32	0.6200	0.6100	0.5940	0.6040	0.5980

33	0.6120	0.6140	0.5860	0.6080	0.6020
34	0.6080	0.5980	0.5840	0.5880	0.5720
35	0.6180	0.6140	0.6080	0.6120	0.5920
36	0.6260	0.6320	0.6120	0.6100	0.5720
37	0.6220	0.6240	0.6100	0.6040	0.5760
38	0.6160	0.6220	0.6180	0.6240	0.5740
39	0.6600	0.6500	0.6440	0.6380	0.5740
40	0.6740	0.6700	0.6580	0.6580	0.5880
41	0.6720	0.6640	0.6480	0.6500	0.6480
42	0.6640	0.6600	0.6320	0.6440	0.6380
43	0.6560	0.6400	0.6280	0.6420	0.6280
44	0.6220	0.5880	0.5780	0.5880	0.5980
45	0.6220	0.6080	0.6000	0.6080	0.6160
46	0.6240	0.6100	0.5780	0.5880	0.5920
47	0.6060	0.5920	0.5760	0.5900	0.5880
48	0.6140	0.5980	0.5720	0.5940	0.5920
49	0.5980	0.5840	0.5720	0.5700	0.6020
50	0.6060	0.5960	0.5860	0.5860	0.5940

After 100 Cycles

Pos.#	B1	B2	B3	B4	B5
1	0.6860	0.6820	0.6760	0.6800	0.6780
2	0.6700	0.6780	0.6540	0.6740	0.6660
3	0.6680	0.6520	0.6240	0.6300	0.6620
4	0.6340	0.6040	0.6200	0.6240	0.6280
5	0.6340	0.6240	0.6100	0.6200	0.6340
6	0.6220	0.6040	0.6200	0.6300	0.6420
7	0.6220	0.6020	0.5860	0.6160	0.6240
8	0.6220	0.6080	0.5820	0.6060	0.6180
9	0.6240	0.6000	0.6100	0.6020	0.6260
10	0.6100	0.6160	0.6340	0.6140	0.6160
11	0.6100	0.6120	0.6280	0.6100	0.6220
12	0.6080	0.6140	0.6080	0.6040	0.6160
13	0.5940	0.6160	0.5900	0.6020	0.6160
14	0.5920	0.6100	0.5920	0.6020	0.6020
15	0.6040	0.5960	0.5900	0.6060	0.6060
16	0.6020	0.6140	0.5920	0.6280	0.6020
17	0.6000	0.6100	0.5900	0.6120	0.6060
18	0.5960	0.6060	0.6140	0.5980	0.6220
19	0.6000	0.6020	0.6240	0.6000	0.6220
20	0.6020	0.6140	0.6180	0.6180	0.6240
21	0.6080	0.5980	0.6100	0.6260	0.6280
22	0.5980	0.6060	0.6180	0.6180	0.6120
23	0.6040	0.6120	0.6200	0.6060	0.6040
24	0.6040	0.6140	0.6160	0.6180	0.6000
25	0.6040	0.6180	0.6140	0.6160	0.6180
26	0.6020	0.6160	0.6180	0.6120	0.6160
27	0.6020	0.6040	0.6180	0.6040	0.6060
28	0.5960	0.6100	0.6040	0.5980	0.6060

29	0.6000	0.6260	0.6080	0.6040	0.6080
30	0.5960	0.6460	0.6120	0.6220	0.5980
31	0.6120	0.6320	0.6140	0.6140	0.6160
32	0.6100	0.6140	0.6060	0.6100	0.6200
33	0.5980	0.6180	0.5960	0.6100	0.6220
34	0.6000	0.6140	0.6020	0.6240	0.6120
35	0.6260	0.6100	0.6020	0.6260	0.6180
36	0.6200	0.6440	0.6320	0.6300	0.6160
37	0.6120	0.6400	0.6260	0.6180	0.6220
38	0.6040	0.6380	0.6000	0.6180	0.6220
39	0.6200	0.6320	0.6000	0.6180	0.6200
30	0.6240	0.6520	0.6160	0.6360	0.6180
31	0.6240	0.6620	0.6120	0.6420	0.6340
32	0.6180	0.6320	0.6180	0.6280	0.6180
33	0.6160	0.6380	0.6260	0.6180	0.6120
34	0.6180	0.6320	0.6260	0.6280	0.6200
35	0.6340	0.6240	0.6220	0.6220	0.6420
36	0.6320	0.6320	0.6400	0.6220	0.6340
37	0.6360	0.6400	0.6420	0.6260	0.6260
38	0.6340	0.6600	0.6620	0.6540	0.5980
39	0.6740	0.6620	0.6680	0.6680	0.6100
40	0.6700	0.6700	0.6620	0.6840	0.6100
41	0.6860	0.6820	0.6760	0.6800	0.6780
42	0.6700	0.6780	0.6540	0.6740	0.6660
43	0.6680	0.6520	0.6240	0.6300	0.6620
44	0.6340	0.6040	0.6200	0.6240	0.6280
45	0.6340	0.6240	0.6100	0.6200	0.6340
46	0.6220	0.6040	0.6200	0.6300	0.6420
47	0.6220	0.6020	0.5860	0.6160	0.6240
48	0.6220	0.6080	0.5820	0.6060	0.6180
49	0.6240	0.6000	0.6100	0.6020	0.6260
50	0.6100	0.6160	0.6340	0.6140	0.6160

After Thermal

Pos.#	B1	B2	B3	B4	B5
1	0.7081	0.7261	0.6981	0.7021	0.6881
2	0.7041	0.6981	0.7061	0.7121	0.6601
3	0.6941	0.7161	0.6801	0.6901	0.6861
4	0.6821	0.6901	0.6701	0.6881	0.6821
5	0.7021	0.7081	0.6881	0.6981	0.6861
6	0.6961	0.6941	0.6881	0.6961	0.6861
7	0.6921	0.6901	0.6801	0.6801	0.6921
8	0.6741	0.6901	0.6641	0.6761	0.7001
9	0.6741	0.6801	0.6721	0.6801	0.6801
10	0.6621	0.7121	0.6741	0.6841	0.6881
11	0.6741	0.7101	0.6721	0.6901	0.7021
12	0.6801	0.7141	0.6701	0.6701	0.6781
13	0.6621	0.6921	0.6781	0.6921	0.6801
14	0.6641	0.6901	0.6721	0.6801	0.6681

15	0.6801	0.6881	0.6861	0.6941	0.6921
16	0.6901	0.6941	0.6721	0.7041	0.6801
17	0.6761	0.6741	0.6781	0.7001	0.6921
18	0.6861	0.6741	0.6881	0.6861	0.6861
19	0.6601	0.6681	0.6581	0.6761	0.6701
20	0.6741	0.6901	0.6681	0.6681	0.6621
21	0.6901	0.6801	0.6601	0.6761	0.6841
22	0.6641	0.6941	0.6681	0.6641	0.6741
23	0.6681	0.6781	0.6601	0.6661	0.6681
24	0.6721	0.6641	0.6681	0.6521	0.6641
25	0.6781	0.6601	0.6681	0.6721	0.6841
26	0.6721	0.6861	0.6861	0.6761	0.6901
27	0.6661	0.6721	0.6721	0.6701	0.6961
28	0.6701	0.6701	0.6601	0.6681	0.6861
29	0.6781	0.6621	0.6581	0.6621	0.6801
30	0.6821	0.6761	0.6721	0.6561	0.6761
31	0.6901	0.6681	0.6661	0.6721	0.7001
32	0.6621	0.6781	0.6841	0.6621	0.6861
33	0.6661	0.6701	0.6721	0.6741	0.6741
34	0.6761	0.6701	0.6541	0.6681	0.6641
35	0.6641	0.6701	0.6541	0.6821	0.6781
36	0.6721	0.6621	0.6641	0.6701	0.6641
37	0.6481	0.6561	0.6441	0.6701	0.6701
38	0.6621	0.6781	0.6541	0.6821	0.6721
39	0.6681	0.6701	0.6461	0.6874	0.6661
30	0.6681	0.6781	0.6621	0.6541	0.6681
31	0.6721	0.6701	0.6661	0.6661	0.6921
32	0.6741	0.6881	0.6801	0.6661	0.6781
33	0.6741	0.6841	0.6781	0.6761	0.6841
34	0.6801	0.6741	0.6701	0.6641	0.6801
35	0.6821	0.6721	0.6661	0.6761	0.6981
36	0.6961	0.6941	0.6821	0.6761	0.6921
37	0.6841	0.6821	0.6741	0.6661	0.6841
38	0.6961	0.6961	0.6881	0.6741	0.6821
39	0.7161	0.6981	0.7061	0.6901	0.6901
40	0.7101	0.7201	0.7101	0.7081	0.7101
41	0.7081	0.7261	0.6981	0.7021	0.6881
42	0.7041	0.6981	0.7061	0.7121	0.6601
43	0.6941	0.7161	0.6801	0.6901	0.6861
44	0.6821	0.6901	0.6701	0.6881	0.6821
45	0.7021	0.7081	0.6881	0.6981	0.6861
46	0.6961	0.6941	0.6881	0.6961	0.6861
47	0.6921	0.6901	0.6801	0.6801	0.6921
48	0.6741	0.6901	0.6641	0.6761	0.7001
49	0.6741	0.6801	0.6721	0.6801	0.6801
50	0.6621	0.7121	0.6741	0.6841	0.6881

LSEM DV:

Initial

Pos.#	B1	B2	B3	B4	B5
1	0.6460	0.6460	0.6220	0.6400	0.6300
2	0.6340	0.6300	0.6200	0.6260	0.6380
3	0.6020	0.6260	0.5920	0.6200	0.6380
4	0.5940	0.6000	0.5820	0.5940	0.5920
5	0.6080	0.6200	0.5940	0.6140	0.5960
6	0.5920	0.6040	0.5740	0.5860	0.6000
7	0.5780	0.5920	0.5700	0.5820	0.5920
8	0.5820	0.6000	0.5700	0.5780	0.5760
9	0.5720	0.5760	0.5780	0.5780	0.5760
10	0.5960	0.5920	0.5880	0.5820	0.5820
11	0.5920	0.5880	0.5860	0.5820	0.5820
12	0.5720	0.5760	0.5780	0.5840	0.5800
13	0.5800	0.5960	0.5660	0.5820	0.5760
14	0.5740	0.5880	0.5740	0.5780	0.5760
15	0.5780	0.5980	0.5700	0.5840	0.5820
16	0.5780	0.5800	0.5760	0.5880	0.5720
17	0.5680	0.5740	0.5660	0.5640	0.5660
18	0.5780	0.5760	0.5560	0.5640	0.5680
19	0.5760	0.5820	0.5720	0.5760	0.5720
20	0.5920	0.6040	0.5840	0.5920	0.5960
21	0.5820	0.5880	0.5800	0.5900	0.5900
22	0.5700	0.5760	0.5580	0.5680	0.5660
23	0.5680	0.5740	0.5620	0.5680	0.5600
24	0.5720	0.5660	0.5840	0.5880	0.5640
25	0.5820	0.5960	0.5900	0.5960	0.5820
26	0.5780	0.5940	0.5820	0.5900	0.5920
27	0.5680	0.5760	0.5720	0.5760	0.5740
28	0.5740	0.5820	0.5700	0.5720	0.5760
29	0.5820	0.5740	0.5720	0.5760	0.5820
30	0.5880	0.6000	0.5880	0.5920	0.5940
31	0.5860	0.5920	0.5880	0.5900	0.5920
32	0.5860	0.5780	0.5680	0.5780	0.5780
33	0.5700	0.5820	0.5780	0.5760	0.5720
34	0.5900	0.5760	0.5920	0.6000	0.5820
35	0.5940	0.5900	0.5960	0.5880	0.5880
36	0.6020	0.5840	0.5880	0.5880	0.5900
37	0.5820	0.5820	0.5740	0.5820	0.5760
38	0.5960	0.5780	0.5880	0.5760	0.5800
39	0.5880	0.5940	0.5980	0.5820	0.5900
30	0.5960	0.6020	0.6040	0.6020	0.5940
31	0.5940	0.5860	0.5840	0.5900	0.5900
32	0.5740	0.5780	0.5600	0.5740	0.5740
33	0.5920	0.5640	0.5640	0.5620	0.5740
34	0.5920	0.5920	0.5840	0.5960	0.5920
35	0.5920	0.6060	0.5920	0.6040	0.6000

36	0.6020	0.6020	0.5960	0.6020	0.5920
37	0.5860	0.5920	0.5880	0.5940	0.5800
38	0.5740	0.5900	0.5820	0.5780	0.5840
39	0.6120	0.6140	0.6140	0.6080	0.6060
40	0.6320	0.6280	0.6080	0.6240	0.6060
41	0.6460	0.6460	0.6220	0.6400	0.6300
42	0.6340	0.6300	0.6200	0.6260	0.6380
43	0.6020	0.6260	0.5920	0.6200	0.6380
44	0.5940	0.6000	0.5820	0.5940	0.5920
45	0.6080	0.6200	0.5940	0.6140	0.5960
46	0.5920	0.6040	0.5740	0.5860	0.6000
47	0.5780	0.5920	0.5700	0.5820	0.5920
48	0.5820	0.6000	0.5700	0.5780	0.5760
49	0.5720	0.5760	0.5780	0.5780	0.5760
50	0.5960	0.5920	0.5880	0.5820	0.5820

After 100 Cycles

Pos.#	B1	B2	B3	B4	B5
1	0.6380	0.6600	0.6240	0.6400	0.6260
2	0.6400	0.6500	0.6200	0.6300	0.6260
3	0.6300	0.6480	0.6240	0.6240	0.6240
4	0.6440	0.6220	0.6060	0.6140	0.6000
5	0.6180	0.6340	0.6180	0.6200	0.6080
6	0.6100	0.6380	0.6000	0.6160	0.5980
7	0.6140	0.6240	0.5980	0.6020	0.5920
8	0.5980	0.6220	0.5900	0.6120	0.5880
9	0.5960	0.5940	0.5800	0.6000	0.5710
10	0.6160	0.6080	0.5880	0.6020	0.5780
11	0.6180	0.6060	0.6000	0.5980	0.5900
12	0.6100	0.6040	0.5900	0.5940	0.5860
13	0.6120	0.6180	0.5880	0.5880	0.5760
14	0.6100	0.6120	0.5860	0.5920	0.5860
15	0.6140	0.6240	0.6000	0.5920	0.5960
16	0.6120	0.6060	0.6140	0.5960	0.6000
17	0.5940	0.6020	0.5940	0.5920	0.5900
18	0.6000	0.5900	0.5780	0.6000	0.5900
19	0.6020	0.5960	0.6000	0.6000	0.5880
20	0.6080	0.5940	0.6000	0.6080	0.6020
21	0.6120	0.5980	0.6060	0.6020	0.6080
22	0.6000	0.6020	0.5960	0.5860	0.5940
23	0.6020	0.6100	0.5880	0.5980	0.5860
24	0.5880	0.5960	0.6000	0.5920	0.5920
25	0.6060	0.6080	0.6080	0.5980	0.6120
26	0.6120	0.5940	0.6040	0.6040	0.5900
27	0.6060	0.5860	0.5840	0.6080	0.5760
28	0.5920	0.6040	0.5940	0.6000	0.5840
29	0.5900	0.5720	0.5920	0.5980	0.5820
30	0.5900	0.5840	0.6060	0.6060	0.5900
31	0.6020	0.5940	0.6060	0.5960	0.6020

32	0.5920	0.5860	0.5940	0.5880	0.5940
33	0.5980	0.5880	0.5840	0.5860	0.5900
34	0.5980	0.5880	0.6000	0.5900	0.5960
35	0.6060	0.5860	0.6080	0.5980	0.6020
36	0.6100	0.6040	0.6060	0.5960	0.6000
37	0.5980	0.5960	0.5900	0.5920	0.5920
38	0.6040	0.6020	0.5920	0.6000	0.6020
39	0.6120	0.5880	0.6000	0.5940	0.6040
30	0.6200	0.6020	0.6000	0.5980	0.6080
31	0.6160	0.5900	0.5960	0.6000	0.6040
32	0.5940	0.5820	0.5860	0.5780	0.5840
33	0.5960	0.5900	0.6080	0.5780	0.5860
34	0.6040	0.5900	0.5860	0.6020	0.5880
35	0.6060	0.5960	0.5940	0.6080	0.5900
36	0.6120	0.6020	0.6020	0.6060	0.6040
37	0.6080	0.6000	0.5960	0.5980	0.5920
38	0.5960	0.6040	0.6000	0.5960	0.5820
39	0.6260	0.6180	0.6200	0.6100	0.6160
40	0.6440	0.6260	0.6160	0.6220	0.6160
41	0.6380	0.6600	0.6240	0.6400	0.6260
42	0.6400	0.6500	0.6200	0.6300	0.6260
43	0.6300	0.6480	0.6240	0.6240	0.6240
44	0.6440	0.6220	0.6060	0.6140	0.6000
45	0.6180	0.6340	0.6180	0.6200	0.6080
46	0.6100	0.6380	0.6000	0.6160	0.5980
47	0.6140	0.6240	0.5980	0.6020	0.5920
48	0.5980	0.6220	0.5900	0.6120	0.5880
49	0.5960	0.5940	0.5800	0.6000	0.5710
50	0.6160	0.6080	0.5880	0.6020	0.5780

After Thermal

Pos.#	B1	B2	B3	B4	B5
1	0.6521	0.6701	0.6721	0.6701	0.6601
2	0.6621	0.6541	0.6581	0.6561	0.6481
3	0.6661	0.6421	0.6401	0.6681	0.6661
4	0.6601	0.6421	0.6421	0.6701	0.6501
5	0.6721	0.6601	0.6621	0.6581	0.6561
6	0.6541	0.6581	0.6521	0.6461	0.6481
7	0.6461	0.6541	0.6601	0.6541	0.6541
8	0.6361	0.6441	0.6221	0.6241	0.6201
9	0.6361	0.6561	0.6441	0.6401	0.6461
10	0.6361	0.6501	0.6481	0.6561	0.6381
11	0.6501	0.6581	0.6641	0.6641	0.6561
12	0.6541	0.6581	0.6521	0.6701	0.6641
13	0.6601	0.6581	0.6441	0.6361	0.6681
14	0.6501	0.6381	0.6421	0.6521	0.6581
15	0.6501	0.6741	0.6661	0.6561	0.6421
16	0.6381	0.6541	0.6501	0.6541	0.6561
17	0.6581	0.6701	0.6541	0.6421	0.6561

18	0.6441	0.6381	0.6481	0.6361	0.6381
19	0.6501	0.6501	0.6541	0.6481	0.6461
20	0.6441	0.6501	0.6661	0.6541	0.6461
21	0.6541	0.6581	0.6581	0.6381	0.6641
22	0.6721	0.6381	0.6401	0.6561	0.6561
23	0.6521	0.6541	0.6461	0.6581	0.6541
24	0.6601	0.6421	0.6381	0.6541	0.6461
25	0.6481	0.6521	0.6521	0.6521	0.6444
26	0.6661	0.6421	0.6521	0.6581	0.6521
27	0.6561	0.6521	0.6561	0.6521	0.6601
28	0.6621	0.6501	0.6581	0.6621	0.6521
29	0.6621	0.6581	0.6441	0.6621	0.6601
30	0.6561	0.6501	0.6641	0.6641	0.6521
31	0.6601	0.6701	0.6661	0.6381	0.6421
32	0.6621	0.6441	0.6541	0.6441	0.6401
33	0.6561	0.6541	0.6501	0.6441	0.6501
34	0.6621	0.6441	0.6481	0.6521	0.6341
35	0.6601	0.6581	0.6681	0.6441	0.6481
36	0.6601	0.6521	0.6581	0.6561	0.6461
37	0.6601	0.6561	0.6601	0.6501	0.6581
38	0.6621	0.6381	0.6561	0.6701	0.6521
39	0.6601	0.6501	0.6541	0.6621	0.6461
30	0.6561	0.6421	0.6561	0.6561	0.6361
31	0.6581	0.6561	0.6481	0.6561	0.6661
32	0.6501	0.6341	0.6401	0.6601	0.6561
33	0.6441	0.6621	0.6541	0.6621	0.6581
34	0.6561	0.6461	0.6481	0.6741	0.6541
35	0.6401	0.6741	0.6481	0.6621	0.6461
36	0.6621	0.6701	0.6461	0.6661	0.6421
37	0.6641	0.6601	0.6541	0.6541	0.6661
38	0.6621	0.6501	0.6441	0.6881	0.6481
39	0.6521	0.6601	0.6641	0.6781	0.6801
40	0.6621	0.6661	0.6701	0.6821	0.6741
41	0.6521	0.6701	0.6721	0.6701	0.6601
42	0.6621	0.6541	0.6581	0.6561	0.6481
43	0.6661	0.6421	0.6401	0.6681	0.6661
44	0.6601	0.6421	0.6421	0.6701	0.6501
45	0.6721	0.6601	0.6621	0.6581	0.6561
46	0.6541	0.6581	0.6521	0.6461	0.6481
47	0.6461	0.6541	0.6601	0.6541	0.6541
48	0.6361	0.6441	0.6221	0.6241	0.6201
49	0.6361	0.6561	0.6441	0.6401	0.6461
50	0.6361	0.6501	0.6481	0.6561	0.6381

MATING/UNMATING:

Sample#	Initial Mating	Initial Unmating	After 25 Cycles Mating	After 25 Cycles Unmating	After 50 Cycles Mating	After 50 Cycles Unmating	After 75 Cycles Mating	After 75 Cycles Unmating	After 100 Cycles Mating	After 100 Cycles Unmating	After Thermals Mating	After Thermals Unmating	After Humidity Mating	After Humidity Unmating
1	34.59	14.12	20.85	17.06	20.42	20.73	21.03	16.93	24.52	24.90	14.50	15.56	13.32	14.96
2	24.71	20.65	20.54	18.95	22.58	20.67	22.56	18.30	20.81	16.32	13.29	13.83	11.82	13.41
3	25.37	25.16	20.97	21.22	20.38	16.78	20.57	17.63	23.10	23.90	13.64	15.83	13.18	13.67
4	21.71	24.13	20.00	21.77	19.37	21.52	20.04	22.95	18.73	16.62	12.27	14.64	11.69	14.23
5	22.60	17.89	20.41	24.07	18.86	14.49	19.35	15.96	21.69	23.02	12.84	15.21	13.67	15.94
6	25.39	25.35	20.52	21.60	22.05	25.15	22.78	26.46	23.54	26.84	13.33	15.07	12.59	13.66
7	21.81	18.07	20.37	22.59	19.96	21.71	21.38	24.84	21.91	25.79	13.62	16.14	13.17	11.15
8	24.45	24.31	20.14	21.57	20.77	23.96	23.23	25.24	24.40	25.52	13.79	14.94	12.52	11.32
9	21.12	21.99	18.83	18.42	19.72	18.77	20.00	20.36	22.40	22.21	13.01	14.91	12.43	11.63
10	25.96	24.11	21.98	21.22	23.37	22.18	24.79	24.48	26.33	26.42	13.20	15.12	12.17	15.03

INSULATION RESISTANCE (IR):

Initial Insulation Resistance		
Measured In Meg Ohms		

Pin to Pin		
Mated	Unmated	
X	X	X
Sample# / LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
1	100,000	100,000	100,000
2	100,000	100,000	100,000

Thermal Insulation Resistance		
Measured In Meg Ohms		

Pin to Pin		
Mated	Unmated	
X	X	X
Sample# / LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
1	100,000	100,000	100,000
2	100,000	100,000	100,000

Humidity Insulation Resistance		
Measured In Meg Ohms		

Pin to Pin		
Mated	Unmated	
X	X	X
Sample# / LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
1	100000	100000	100000
2	100000	100000	100000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial DWV
Test Voltage= 675

Pin to Pin		
Mated	Unmated	
Sample#	LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
1	675	675	675
2	675	675	675

Thermal Test Voltage
Test Voltage= 675

Pin to Pin		
Mated	Unmated	
Sample#	LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
1	675	675	675
2	675	675	675

Humidity Test Voltage
Test Voltage= 675

Pin to Pin		
Mated	Unmated	
Sample#	LSEM-DV/LSEM-DH	LSEM-DV	LSEM-DH
1	675	675	675
2	675	675	675

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: OV-5
Description: Forced Air Oven, 5 Cu. Ft., 120 V
Manufacturer: Sheldon Mfg.
Model: CE5F
Serial #: 02008008
Accuracy: +/- 5 deg. C
… Last Cal: 02/19/2009, Next Cal: 02/19/2010

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 04/07/2009, Next Cal: 04/07/2010

Equipment #: MV-06
Description: 6" x 6" Video Measuring Machine
Manufacturer: Micro-Vu
Model: M3010898
Serial #: V9343
Accuracy: See Manual
… Last Cal: 02/10/2009, Next Cal: 02/10/2010

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: 5/12/2009, Next Cal: 5/6/2010

Equipment #: MV-08
Description: 6" x 6" Video Measuring Machine
Manufacturer: Micro-Vu
Model: M3010898
Serial #: V9472
Accuracy: See Manual
… Last Cal: 02/10/2009, Next Cal: 02/10/2010

Equipment #: THC-04
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-3800
Serial #: 37782
Accuracy: See Manual
… Last Cal: 04/07/2009, Next Cal: 04/07/2010

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy 2 % Full Scale Accuracy
… Last Cal: 11/24/08, Next Cal: 11/24/09