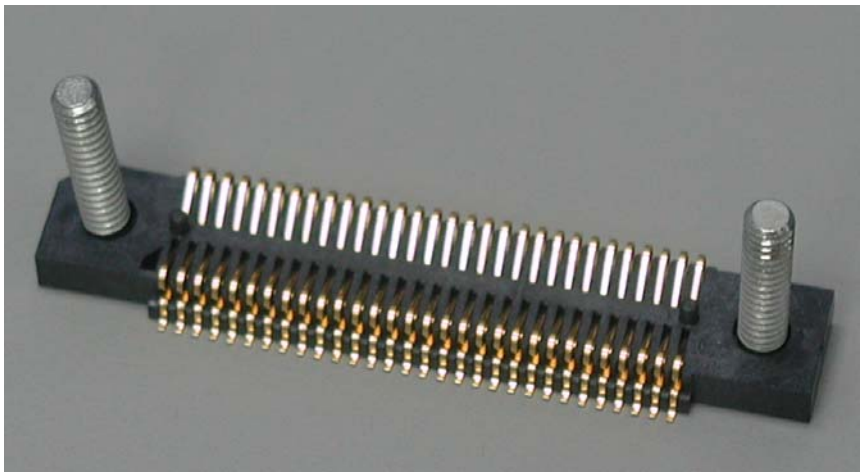
Project Number:	Tracking Code: TC0628--1100		
Requested by: Nathan Brown	Date: 7/11/2006	Product Rev: U	
Part #: FSI-1XX-03-G-D-AD-SD	Lot #: NA	Tech: Tony Wagoner/Troy Cook	Eng: Dave Scopelliti
Part description: FSI-SD			Qty to test: 32
Test Start: 07/08/2006	Test Completed: 9/13/2006		



FSI-1XX-03-G-D-AD-SD
DVT REPORT

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: Please test per flowchart located at F:\DWG\APPLICAT\NPDOCS\EPMS\Projects\1mm\FSI Flex\FSI-SD Option Flowchart.xls

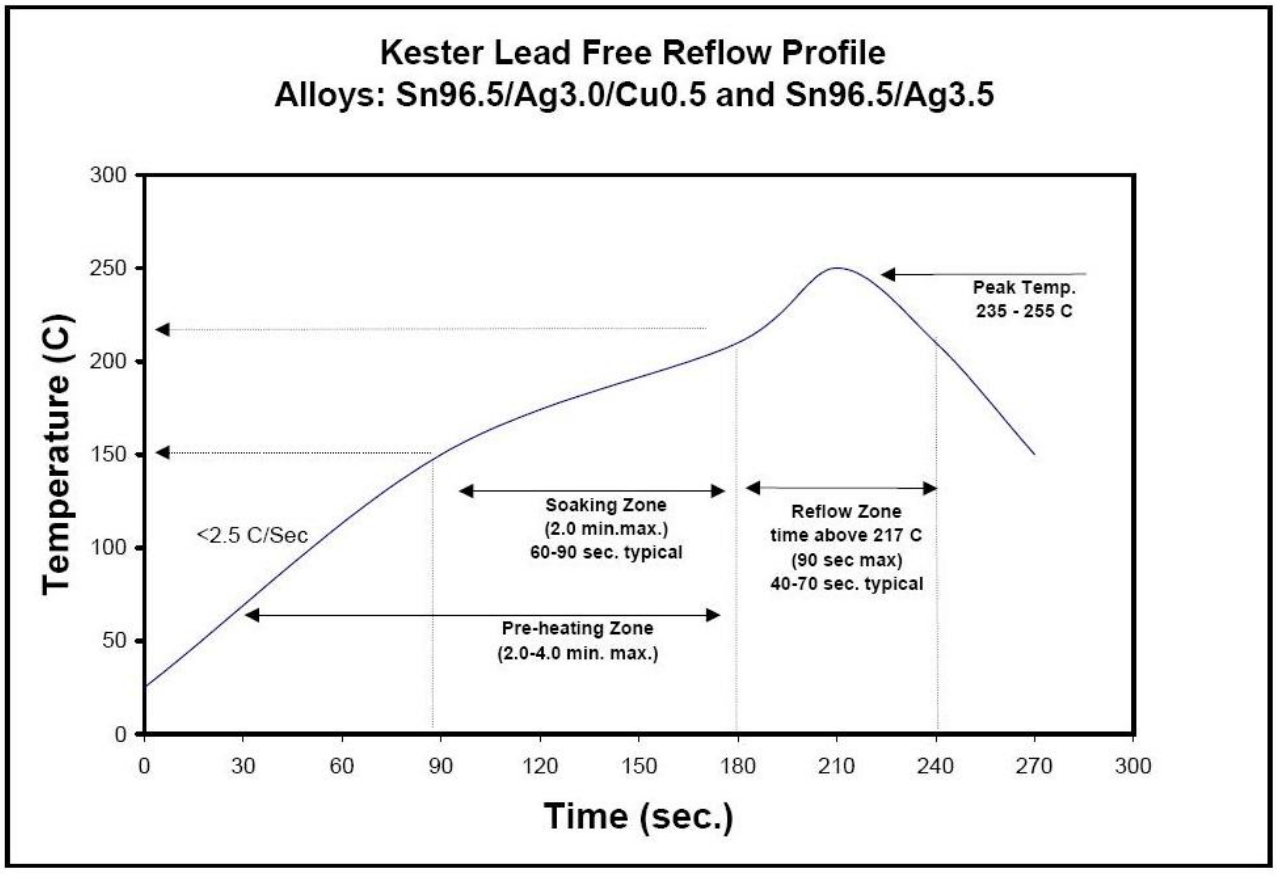
APPLICABLE DOCUMENTS

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) Internal Test PCBs used: PCB-100407-TST-Xx

OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

IR / DWV

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

Thermal Aging = EIA-364-17, Test Condition 3, 85 deg C;
Time Condition 'A' (96 hours)
Humidity =EIA-364-31, Test Condition A' (96 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

Thermal/Humidity

TEST STEP	**GROUP A Thermal/Humidity**
01	LLCR-1
02	Thermal Aging
03	LLCR-2
04	Humidity
05	LLCR-3

Thermal Aging = EIA-364-17, 105 deg C, Condition 'C' for 250 hours
Humidity = EIA 364-31, Method III excluding Steps 7a , 7b
Test time Condition "B" for 240 Hours

FLOWCHARTS Continued

Torque Testing

TEST STEP	GROUP A Torque Testing of Threaded stud	GROUP B Torque Testing of Threaded stud after Thermal
01	Torque Test	Thermal Aging
02	Data Review	Torque Test

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) Connectors are sometimes mated and all samples are pre-conditioned at ambient.

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) Connectors are sometimes mated and all samples are pre-conditioned at ambient.

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
        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
        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).

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

SUPPLEMENTAL TESTS

TORQUE TESTING:

1) Torque testing done both before and after thermal exposure.
2) Two (2) groups of samples were tested after thermal exposure.
    A. One group that had been tightened during thermal exposure.
    B. One group that had not been tightened during thermal exposure.

RESULTS

Insulation Resistance minimums, IR

- **Initial**
  - **Mated---------- 50,000 Meg Ω ---------- Pass**
  - **Unmated ---------- 50,000 Meg Ω**
- **Thermal**
  - **Mated---------- 50,000 Meg Ω**
  - **Unmated ---------- 50,000 Meg Ω**
- **Humidity**
  - **Mated----------100,000 Meg Ω**
  - **Unmated ---------- 25,000 Meg Ω**

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
  - **Breakdown**
    - **Mated ----------1,060 VAC**
    - **Unmated----------1,100 VAC**
  - **DWV**
    - **Mated ----------795 VAC**
    - **Unmated----------825 VAC**
  - **Working voltage**
    - **Mated ----------265 VAC**
    - **Unmated----------275 VAC**
- **Thermal**
  - **Breakdown**
    - **Mated ----------1,080 VAC**
    - **Unmated----------1,100 VAC**
  - **DWV**
    - **Mated ----------810 VAC**
    - **Unmated----------825 VAC**
  - **Working voltage**
    - **Mated ----------270 VAC**
    - **Unmated----------275 VAC**
- **Humidity**
  - **Breakdown**
    - **Mated ----------1,060 VAC**
    - **Unmated----------1,040 VAC**
  - **DWV**
    - **Mated ----------795 VAC**
    - **Unmated----------780 VAC**
  - **Working voltage**
    - **Mated ----------265 VAC**
    - **Unmated----------260 VAC**

RESULTS (continued)

LLCR Durability (200 LLCR test points)

- **Initial ---------- 11.5 mOhms Max**

- **Thermal**
  - **<= +5.0 mOhms ---------- 178 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 22 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 ---------- 167 Points ---------- Stable**
  - **+5.1 to +10.0 mOhms ---------- 29 Points ---------- Minor**
  - **+10.1 to +15.0 mOhms ---------- 4 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**

SUPPLEMENTAL TESTING

Torque Testing

- **Initial**
  - **Min ---------- 4.00 In-Lbs.**
  - **Max ---------- 6.44 In-Lbs.**

- **Thermal**
  - **Min ---------- 4.65 In-Lbs.**
  - **Max ---------- 7.61 In-Lbs.**

DATA SUMMARIES

INSULATION RESISTANCE (IR):

	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Mated	Unmated	Mated	Unmated	Mated	Unmated
	Insulation Resistance	Insulation Resistance	Insulation Resistance	Insulation Resistance	Insulation Resistance	Insulation Resistance
Average	50000	50000	50000	100000	100000	25000
Min	50000	50000	50000	100000	100000	25000
Max	50000	50000	50000	100000	100000	25000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

	Initial, VAC Mated			Initial, VAC Unmated		
	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
Average	1067	800	267	1080	810	270
Min	1060	795	265	1040	780	260
Max	1080	810	270	1100	825	275

	Thermal, VAC Mated			Thermal, VAC Unmated		
	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
Average	1080	810	270	1100	825	275
Min	1080	810	270	1100	825	275
Max	1080	810	270	1100	825	275

	Humidity, VAC Mated			Humidity, VAC Unmated		
	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
Average	1060	795	265	1040	780	260
Min	1060	795	265	1040	780	260
Max	1060	795	265	1040	780	260

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

Date	Aug. 07 2006	Aug. 18 2006	Sep. 13 2006
Room Temp C	21	21	21
RH	52%	57%	32%
Name	Tony Wagoner	Tony Wagoner	Troy Cook
mOhm values	**Actual Initial**	**Delta Thermals**	**Delta Humidity**
Average	9.4	3.0	3.0
St. Dev.	1.2	1.7	2.4
Min	6.5	-0.3	-1.5
Max	11.5	8.5	12.6
Count	200	200	200

SUPPLEMENTAL TESTS

TORQUE TESTING:

Initial Torque

Initial Torque	
Sample#	Torque (In-Lbs)
Minimum	4.00
Maximum	6.44
Average	**5.24**

Torque after Thermal

Assemblies with Hold-down Nuts		**Assemblies without Hold-down Nuts**	
Sample#	Torque (In-Lbs)	Sample#	Torque (In-Lbs)
Minimum	4.65	Minimum	5.02
Maximum	6.28	Maximum	7.61
Average	**5.48**	Average	**5.86**

DATA

INSULATION RESISTANCE (IR):

	Initial, Meg Ohms		Thermal, Meg Ohms		Humidity, Meg Ohms	
	Mated	Unmated	Mated	Unmated	Mated	Unmated
Sample #	Insulation Resistance	Insulation Resistance	Insulation Resistance	Insulation Resistance	Insulation Resistance	Insulation Resistance
1	50000	50000	50000	100000	100000	25000

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

	Initial, VAC Mated			Initial, VAC Unmated		
Sample #	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
1	1060	795	265	1100	825	275

	Thermal, VAC Mated			Thermal, VAC Unmated		
Sample #	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
1	1080	810	270	1100	825	275

	Humidity, VAC Mated			Humidity, VAC Unmated		
Sample #	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
1	1060	795	265	1040	780	260

DATA Continued

LLCR:

mOhm values		Actual	Delta	Delta
Board	Position	Initial	Thermals	Humidity
1	P1	8.5	3.0	2.9
1	P2	8.6	3.0	2.6
1	P3	9.6	3.0	2.3
1	P4	9.7	1.9	1.4
1	P5	10.0	1.7	0.6
1	P6	8.4	4.3	4.3
1	P7	9.1	3.4	2.9
1	P8	10.1	1.3	1.0
1	P9	11.1	1.2	3.0
1	P10	11.4	1.9	1.6
1	P11	10.4	4.0	3.1
1	P12	11.1	3.8	4.7
1	P13	10.9	4.9	4.9
1	P14	10.6	5.1	2.2
1	P15	10.8	3.0	1.0
1	P16	10.6	2.4	0.7
1	P17	11.5	3.1	1.3
1	P18	10.4	3.0	2.0
1	P19	9.2	3.3	2.8
1	P20	7.6	4.3	11.1
1	P21	10.9	0.9	8.2
1	P22	9.6	2.5	1.1
1	P23	10.0	1.9	0.2
1	P24	7.7	2.8	2.5
1	P25	8.1	5.0	3.5
2	P1	9.6	1.5	-1.5
2	P2	8.2	4.9	-0.3
2	P3	9.6	3.0	-1.2
2	P4	10.2	6.5	8.5
2	P5	10.1	3.5	0.4
2	P6	7.9	4.3	0.1
2	P7	8.3	7.2	2.1
2	P8	9.9	4.5	1.7
2	P9	10.7	3.3	2.6
2	P10	10.2	1.8	1.5
2	P11	10.6	3.2	1.4
2	P12	10.3	3.8	0.9
2	P13	10.4	3.1	-0.2
2	P14	9.8	4.9	1.6
2	P15	10.2	3.4	2.8
2	P16	10.0	4.0	2.0

2	P17	9.8	2.5	1.6
2	P18	8.9	3.9	2.4
2	P19	7.7	4.7	3.3
2	P20	7.1	1.9	4.6
2	P21	9.7	1.2	1.1
2	P22	9.2	1.7	1.0
2	P23	8.6	3.1	2.3
2	P24	7.7	5.1	5.5
2	P25	7.6	7.2	4.5
3	P1	9.9	2.0	0.6
3	P2	11.1	2.8	-0.2
3	P3	9.6	3.2	1.4
3	P4	9.9	3.2	3.4
3	P5	9.6	5.0	2.4
3	P6	7.8	4.4	6.3
3	P7	8.1	5.8	8.2
3	P8	9.8	2.3	2.5
3	P9	11.3	5.9	10.4
3	P10	10.5	1.6	3.5
3	P11	10.8	2.2	5.5
3	P12	10.7	2.8	1.7
3	P13	10.7	4.1	6.0
3	P14	10.6	7.1	12.6
3	P15	10.4	1.6	1.7
3	P16	10.8	5.9	6.4
3	P17	10.6	4.6	1.5
3	P18	10.0	3.0	3.6
3	P19	10.4	3.9	9.1
3	P20	10.1	6.4	7.2
3	P21	10.7	1.2	2.5
3	P22	10.8	7.2	2.8
3	P23	10.0	1.8	1.3
3	P24	9.8	1.2	1.0
3	P25	10.5	6.5	3.6
4	P1	7.1	4.1	4.0
4	P2	8.5	1.9	2.1
4	P3	7.5	2.4	3.2
4	P4	8.4	1.9	1.6
4	P5	10.2	0.7	2.2
4	P6	8.2	1.3	3.0
4	P7	8.9	2.8	3.6
4	P8	10.7	1.1	2.3
4	P9	10.5	1.6	1.3
4	P10	10.2	0.8	1.4
4	P11	10.1	1.1	1.4
4	P12	10.6	0.7	0.8
4	P13	10.7	1.8	0.6
4	P14	10.3	1.6	0.7
4	P15	10.5	1.0	1.2

4	P16	10.0	1.6	1.7
4	P17	10.6	2.1	0.8
4	P18	9.9	0.9	1.3
4	P19	10.1	0.3	0.5
4	P20	10.3	0.6	0.9
4	P21	10.2	0.9	3.1
4	P22	9.8	1.7	3.2
4	P23	10.1	0.8	1.0
4	P24	7.8	2.3	5.8
4	P25	7.8	3.0	2.6
5	P1	6.5	4.7	3.1
5	P2	6.8	5.1	2.5
5	P3	6.6	3.5	0.9
5	P4	7.5	3.6	2.1
5	P5	7.7	2.8	2.3
5	P6	7.4	2.3	3.1
5	P7	8.2	2.3	8.5
5	P8	10.2	1.1	3.8
5	P9	9.8	1.4	0.7
5	P10	10.4	1.3	4.6
5	P11	10.6	1.0	2.7
5	P12	10.7	1.7	3.8
5	P13	10.2	2.4	6.5
5	P14	10.1	1.2	0.4
5	P15	10.4	0.3	1.4
5	P16	10.2	1.4	1.8
5	P17	10.1	1.3	0.7
5	P18	10.1	1.4	3.4
5	P19	10.4	1.5	4.3
5	P20	9.9	1.3	3.9
5	P21	10.2	1.0	3.5
5	P22	9.9	2.8	2.0
5	P23	10.0	4.8	7.3
5	P24	7.5	4.6	4.0
5	P25	7.5	3.0	2.7
6	P1	7.7	8.0	3.2
6	P2	8.1	4.2	4.8
6	P3	8.3	4.3	5.5
6	P4	9.2	1.5	4.8
6	P5	10.2	0.7	4.0
6	P6	10.3	1.8	8.2
6	P7	10.5	2.7	4.2
6	P8	10.3	4.6	2.9
6	P9	10.9	1.3	3.7
6	P10	10.2	3.4	1.5
6	P11	11.1	2.2	2.3
6	P12	10.0	4.2	4.1
6	P13	10.7	1.6	1.0
6	P14	11.3	2.8	0.3

6	P15	10.3	2.2	1.0
6	P16	10.4	4.3	1.7
6	P17	10.3	3.2	5.4
6	P18	11.2	2.1	0.8
6	P19	10.3	3.4	3.4
6	P20	8.5	2.4	1.5
6	P21	8.9	4.1	6.3
6	P22	8.6	4.9	5.8
6	P23	8.6	2.8	2.4
6	P24	8.5	3.4	0.1
6	P25	7.7	3.7	1.7
7	P1	7.0	1.5	1.7
7	P2	7.1	3.5	3.8
7	P3	8.4	2.1	1.5
7	P4	7.9	2.5	2.6
7	P5	8.3	1.9	4.1
7	P6	7.8	0.4	2.2
7	P7	8.4	1.9	4.1
7	P8	8.9	1.7	3.6
7	P9	9.9	4.8	8.4
7	P10	10.2	0.9	2.3
7	P11	10.4	5.7	6.1
7	P12	9.5	1.9	2.3
7	P13	10.2	1.7	4.3
7	P14	10.5	1.8	3.8
7	P15	9.3	0.8	2.1
7	P16	9.7	0.8	2.5
7	P17	10.1	1.7	5.0
7	P18	9.2	1.1	1.8
7	P19	7.3	2.7	6.9
7	P20	6.9	0.7	5.2
7	P21	8.1	4.0	5.9
7	P22	7.7	3.4	6.2
7	P23	7.5	2.8	10.3
7	P24	7.5	4.2	2.7
7	P25	7.2	1.9	2.0
8	P1	6.8	3.0	1.0
8	P2	7.0	6.4	2.2
8	P3	7.1	2.3	4.0
8	P4	7.8	1.4	2.7
8	P5	8.3	2.6	5.3
8	P6	8.8	4.5	5.9
8	P7	8.0	5.9	7.9
8	P8	9.8	3.0	7.0
8	P9	10.0	-0.3	1.7
8	P10	9.6	2.4	2.9
8	P11	10.3	0.2	0.2
8	P12	9.7	5.2	2.0
8	P13	10.5	1.2	0.6

8	P14	10.2	5.4	2.4
8	P15	10.1	3.3	0.7
8	P16	9.8	3.3	1.6
8	P17	9.9	8.4	0.6
8	P18	9.4	3.8	0.2
8	P19	7.8	1.8	4.8
8	P20	7.1	1.6	1.3
8	P21	10.1	8.5	0.0
8	P22	9.2	4.5	3.3
8	P23	9.9	3.7	1.2
8	P24	8.4	6.1	2.8
8	P25	8.0	4.2	2.4

SUPPLEMENTAL

TORQUE TESTING:

Initial Torque		
Sample#	Pin 1 End	Pin 25 End
1	5.362	4.451
2	5.219	4.949
3	5.02	4.944
4	6.443	5.362
5	5.902	6.172
6	5.02	3.996

Torque after Thermal					
Assemblies with Hold-down Nuts			**Assemblies without Hold-down Nuts**		
Sample#	Pin 1 End	Pin 25 End	Sample#	Pin 1 End	Pin 25 End
1	5.995	4.651	1	5.219	6.499
2	5.995	4.892	2	6.03	5.02
3	5.561	4.892	3	5.226	5.902
4	6.277	5.589	4	7.609	5.362

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: MO-01
Description: Micro-Ohmeter
Manufacturer: Keithley
Model: 580
Serial #: 0772740
Accuracy: See Manual
… Last Cal: 05/12/06, Next Cal: 05/12/07

Equipment #: MO-03
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0791975
Accuracy: See Manual
… Last Cal: 05/12/06, Next Cal: 05/12/07

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: 05/12/06, Next Cal: 05/12/07

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 8/18/2006, Next Cal: 8/18/2007

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 5/12/06, Next Cal: 05/12/07

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