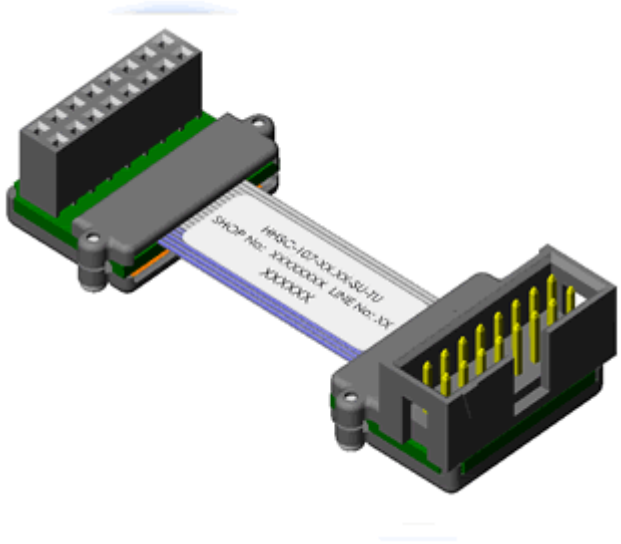
Project Number: NA	Tracking Code: TC0345--0310		
Requested by: John Reid	Date: 11/4/2003	Product Rev: 3	
Part #: HHSC-108-10.00-TD-SE	Lot #: 11/5/03	Tech: TC & TR	Eng: John Tozier
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch			Qty to test: 50
Test Start: 01/21/2004	Test Completed: 3/2/2004		



DVT

PART DESCRIPTION

HHSC-108-10.00-TD-SE

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch	

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
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) The ultrasonic procedure can be used with either aqueous or non-aqueous soldering components and follows:
   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
   c) Sample test boards are removed and placed into the Branson 3510 cleaner containing deionized water with the following conditions:
      i) Temperature: ----------55° C +/- 5° C
      ii) Frequency:----------40 KHz
      iii) Immersion Time: ----------5 to 10 Minutes
   d) 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
   e) Upon removal, the sample test boards are rinsed for 1/2 to 1 minute in room temperature free flowing deionized water.
   f) 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
   g) Sample test boards are then allowed to set and recover to room ambient condition prior to testing.
7) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
8) Any additional preparation will be noted in the individual test sequences

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
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FLOWCHARTS

TEST STEP	GROUP 1 200 Points 500 Cycles
01	LLCR-1
02	Data Review
03	100 Cycles
04	LLCR-2
05	Data Review
06	100 Cycles
07	LLCR-3
08	Data Review
09	200 Cycles
10	LLCR-4
11	Data Review
12	100 Cycles
13	LLCR-5

LLCR = EIA-364-23, LLCR
use Keithley 580 in the dry circuit mode, 10 mA Max

TEST STEP	GROUP 1 8 Adjacent Conductors,Cable Center	GROUP 2 2 Adjacent ground shields, Cable Center
01	CCC	CCC

Tabulate calculated current at RT, 50° C, 60° C and 70° C
after derating 20% and based on 80° C
CCC, Temp rise = EIA-364-70

TEST STEP	GROUP 1A Sig - Sig	GROUP 1B GND - Sig
01	IR	IR
02	Data Review	Data Review
03	Thermal Aging	Thermal Aging
04	IR	IR
05	Data Review	Data Review
06	Humidity	Humidity
07	IR	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 95% RH)
delete steps 7a and 7b

FLOWCHARTS Continued

TEST STEP	GROUP 1A-STD Sig - Sig	GROUP 1B-STD Sig - Sig	GROUP 1C-STD Sig - Sig	GROUP 1A-STD GND- Sig	GROUP 1B-STD GND- Sig	GROUP 1C-STD GND- Sig
01	DWV/Working Voltage	Thermal Aging	Humidity	DWV/Working Voltage	Thermal Aging	Humidity
02		DWV/Working Voltage	DWV/Working Voltage		DWV/Working Voltage	DWV/Working Voltage

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 95% RH)
delete steps 7a and 7b

TEST STEP	GROUP 1A-STD Sig 0°	GROUP 1B-STD Sig 90°	GROUP 1A-STD GND 0°	GROUP 1B-STD GND 90°
01	Pull test, Continuity	Pull test, Continuity	Pull test, Continuity	Pull test, Continuity

Secure the cable in the center
Monitor continuity (4-Wire) and pull
record forces when continuity deviates more than 10 milliOhms

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100" Pitch	

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 and pre-conditioned at ambient.

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) 65^{o} C
   c) 75^{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.

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) Unmated
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).

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) Unmated
      iii) Electrification Time 2.0 minutes
      iv) Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
2) MEASUREMENTS:
   a) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 1000 megohms.

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

CONNECTOR PULL:

1) Secure cable near center and pull on connector
   a) At 90°, right angle to cable
   b) At 0°, in-line with cable

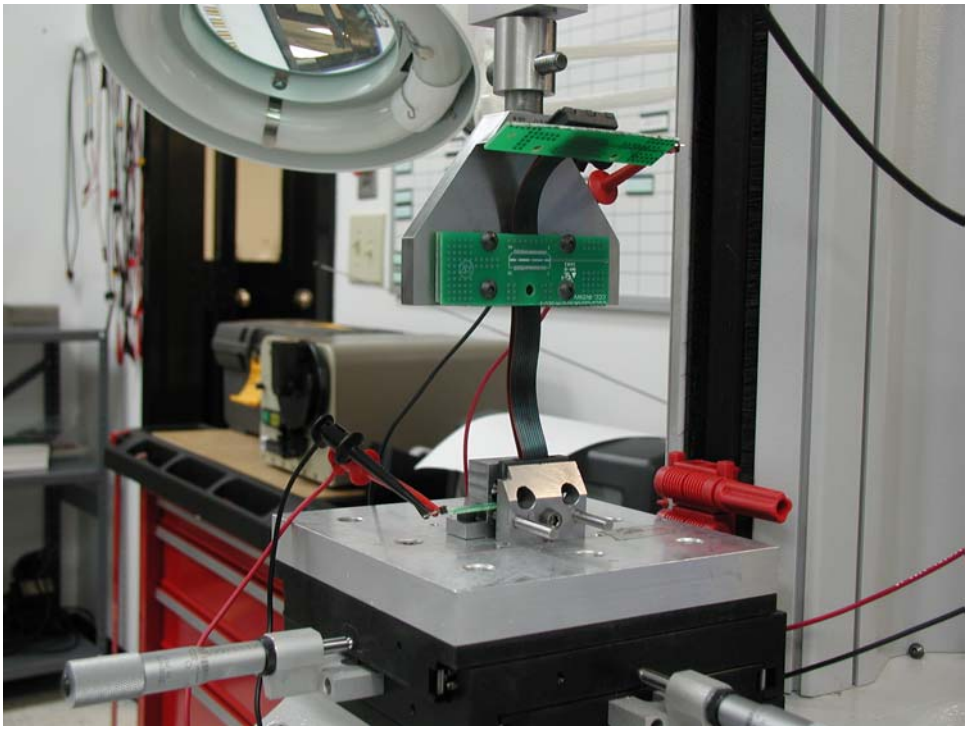

Fig 1
0° Connector pull. Notice the electrical continuity hook-up wires.

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100" Pitch	

RESULTS

Temperature Rise, CCC at 20% de-rated at 70°C, relative to 80°C

- **Signal Conductors Powered ----------0.2A with 14 adjacent conductors powered**
- **Ground Powered----------7.3A**

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
  - **Breakdown**
    - **Sig-Sig ---------- 1750 VAC**
    - **Sig-GND---------- 1500 VAC**
  - **DWV**
    - **Sig-Sig ---------- 1275 VAC**
    - **Sig-GND---------- 1125 VAC**
  - **Working voltage**
    - **Sig-Sig ----------425 VAC**
    - **Sig-GND----------375 VAC**
- **Thermal**
  - **Breakdown**
    - **Sig-Sig ---------- 2000 VAC**
    - **Sig-GND---------- 1000 VAC**
  - **DWV**
    - **Sig-Sig ---------- 1500 VAC**
    - **Sig-GND----------750 VAC**
  - **Working voltage**
    - **Sig-Sig ----------500 VAC**
    - **Sig-GND----------250 VAC**
- **Humidity**
  - **Breakdown**
    - **Sig-Sig ---------- 1500 VAC**
    - **Sig-GND---------- 1000 VAC**
  - **DWV**
    - **Sig-Sig ---------- 1125 VAC**
    - **Sig-GND----------750 VAC**
  - **Working voltage**
    - **Sig-Sig ----------375 VAC**
    - **Sig-GND----------250 VAC**

Insulation Resistance minimums, IR

- **Initial**
  - **Sig-Sig ---------- 25,000 Meg Ω ---------- Pass**
  - **Sig-GND---------- 25,000 Meg Ω ---------- Pass**
- **Thermal**
  - **Sig-Sig ---------- 50,000 Meg Ω**
  - **Sig-GND----------100,000 Meg Ω**
- **Humidity**
  - **Sig-Sig ---------- 25,000 Meg Ω**
  - **Sig-GND---------- 15,000 Meg Ω**

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
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LLCR Durability (135 LLCR test points)

- **Initial ---------- 5.0 mOhms Max**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ---------- 135 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**
- **Durability, 100 Cycles**
  - **<= +5.0 mOhms ---------- 135 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**
  -
- **Durability, 200 Cycles**
  - **<= +5.0 mOhms ---------- 135 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**
- **Durability, 400 Cycles**
  - **<= +5.0 mOhms ---------- 135 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**
- **Durability, 400 Cycles**
  - **<= +5.0 mOhms ---------- 135 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**

SUPPLEMENTAL TESTING

Supplemental – Connector/Cable Pull

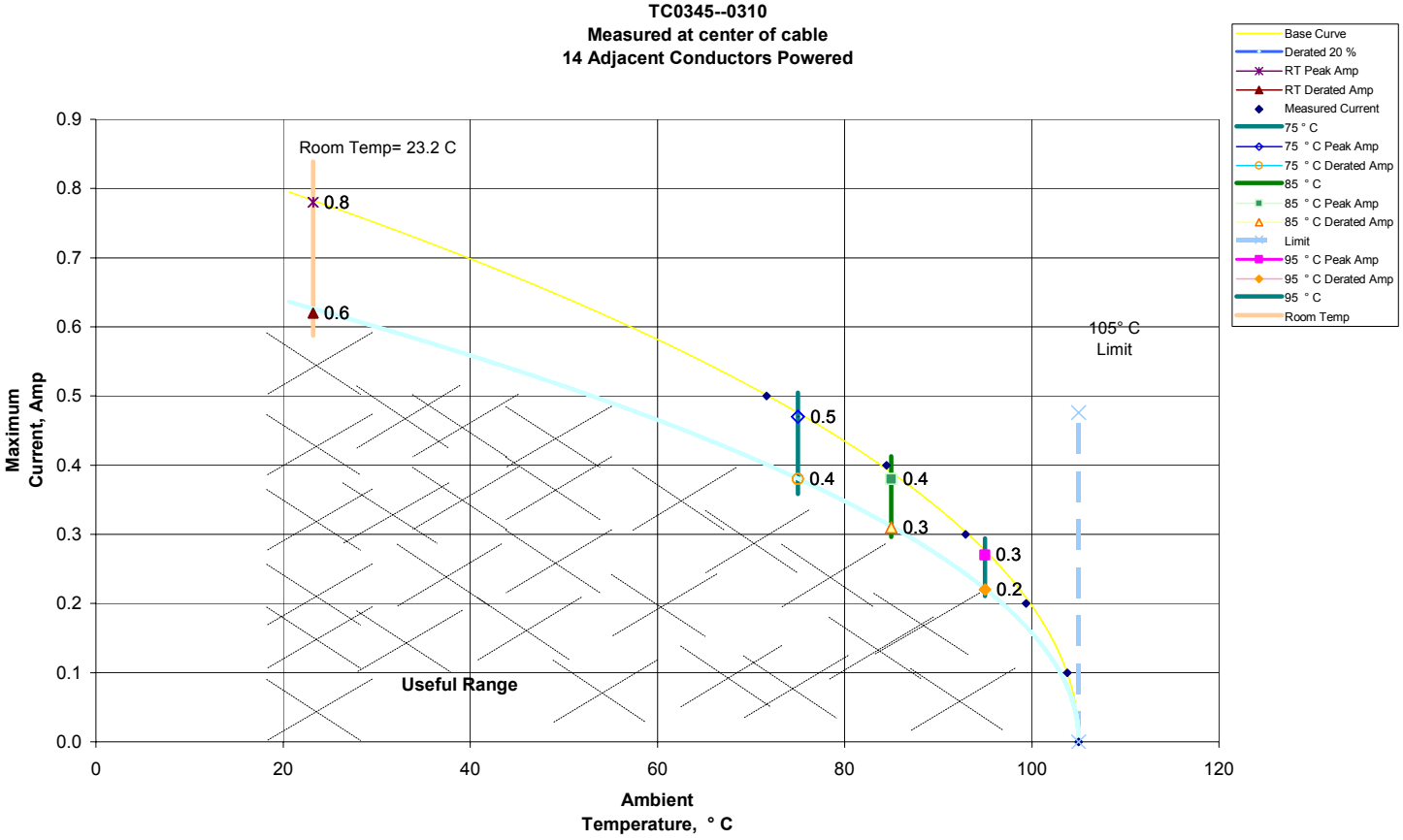
- **0°**
  - **SSQ End**
    - **Signal Conductors ---------- 28.85 lbs**
    - **Ground ---------- 40.11 lbs**
  - **TSS End**
    - **Signal Conductors ---------- 22.39 lbs**
    - **Ground ---------- 40.34 lbs**
- **90°**
  - **SSQ End**
    - **Signal Conductors ---------- 40.67 lbs**
    - **Ground ---------- 23.65 lbs**
  - **TSS End**
    - **Signal Conductors ---------- 17.36 lbs**
    - **Ground ---------- 21.47 lbs**

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch	

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) 14 adjacent conductors were powered:
   a) Linear configuration



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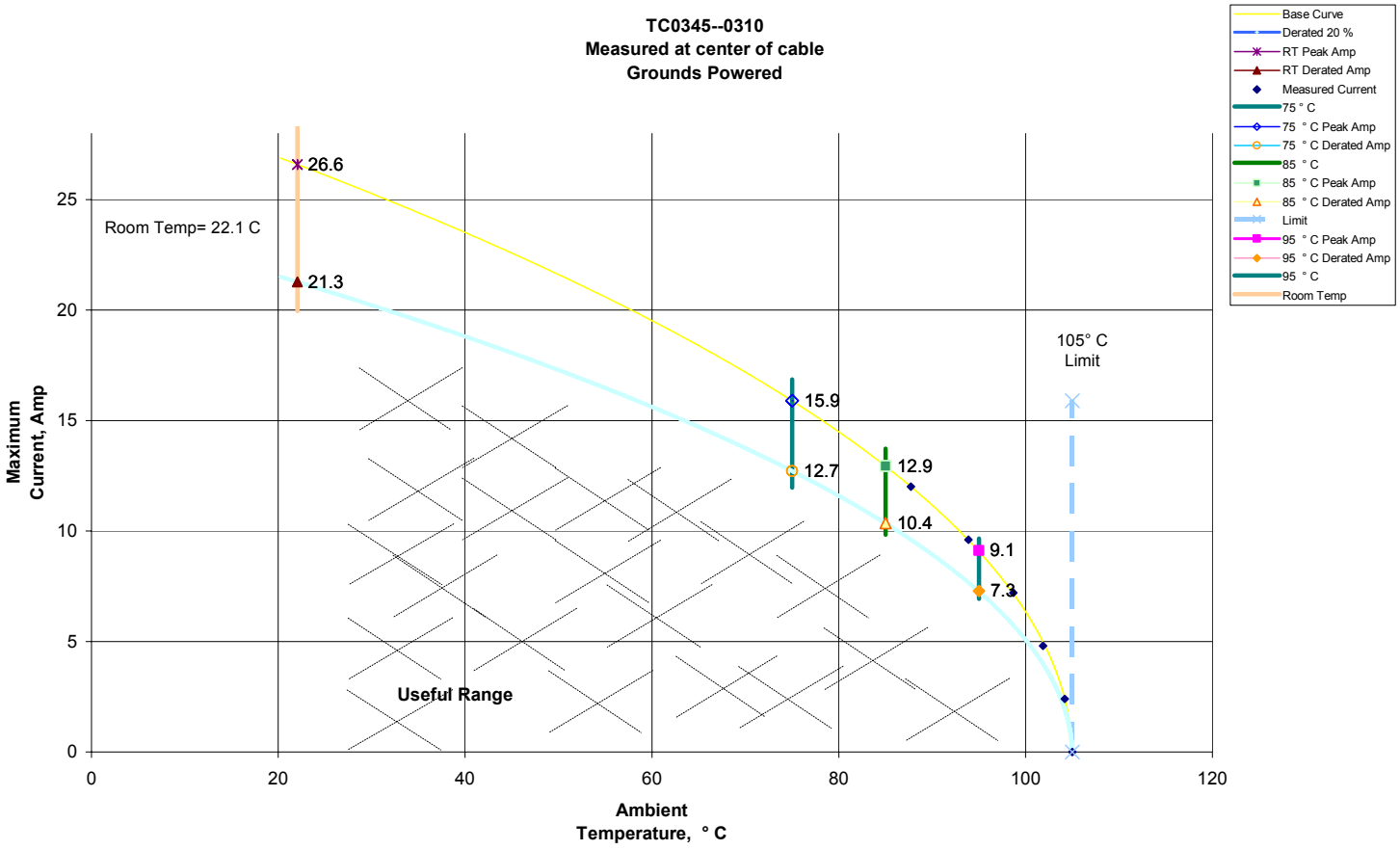
DATA SUMMARIES

TEMPERATURE RISE (Current Carrying Capacity, CCC):



Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100" Pitch	

DATA SUMMARIES Continued

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rate ***500 VAC Per Sec.***
Test Voltage ***Until Breakdown Occurs***

	Sig-Sig Initial, VAC			Sig-Sig Thermal, VAC			Sig-Sig Humidity, VAC		
	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
Average	1750	1313	438	2000	1500	500	1800	1350	450
Min	1700	1275	425	2000	1500	500	1500	1125	375
Max	1800	1350	450	2000	1500	500	2100	1575	525

Voltage Rate ***500 VAC Per Sec.***
Test Voltage ***Until Breakdown Occurs***

	GND-Sig Initial, VAC			GND-Sig Thermal, VAC			GND-Sig Humidity, VAC		
	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage	Breakdown Voltage	DWV	Working Voltage
Average	1550	1163	388	1100	825	275	1050	788	263
Min	1500	1125	375	1000	750	250	1000	750	250
Max	1600	1200	400	1200	900	300	1100	825	275

INSULATION RESISTANCE (IR):

Electrification Time ***Two (2) minutes***
Sig-Sig Meg Ohms

	Initial	Thermal	Humidity
	Insulation Resistance	Insulation Resistance	Insulation Resistance
Average	33333	50000	43750
Min	25000	50000	25000
Max	50000	50000	50000

Electrification Time ***Two (2) minutes***
GND-Sig Meg Ohms

	Initial	Thermal	Humidity
	Insulation Resistance	Insulation Resistance	Insulation Resistance
Average	25000	100000	20000
Min	25000	100000	15000
Max	50000	100000	100000

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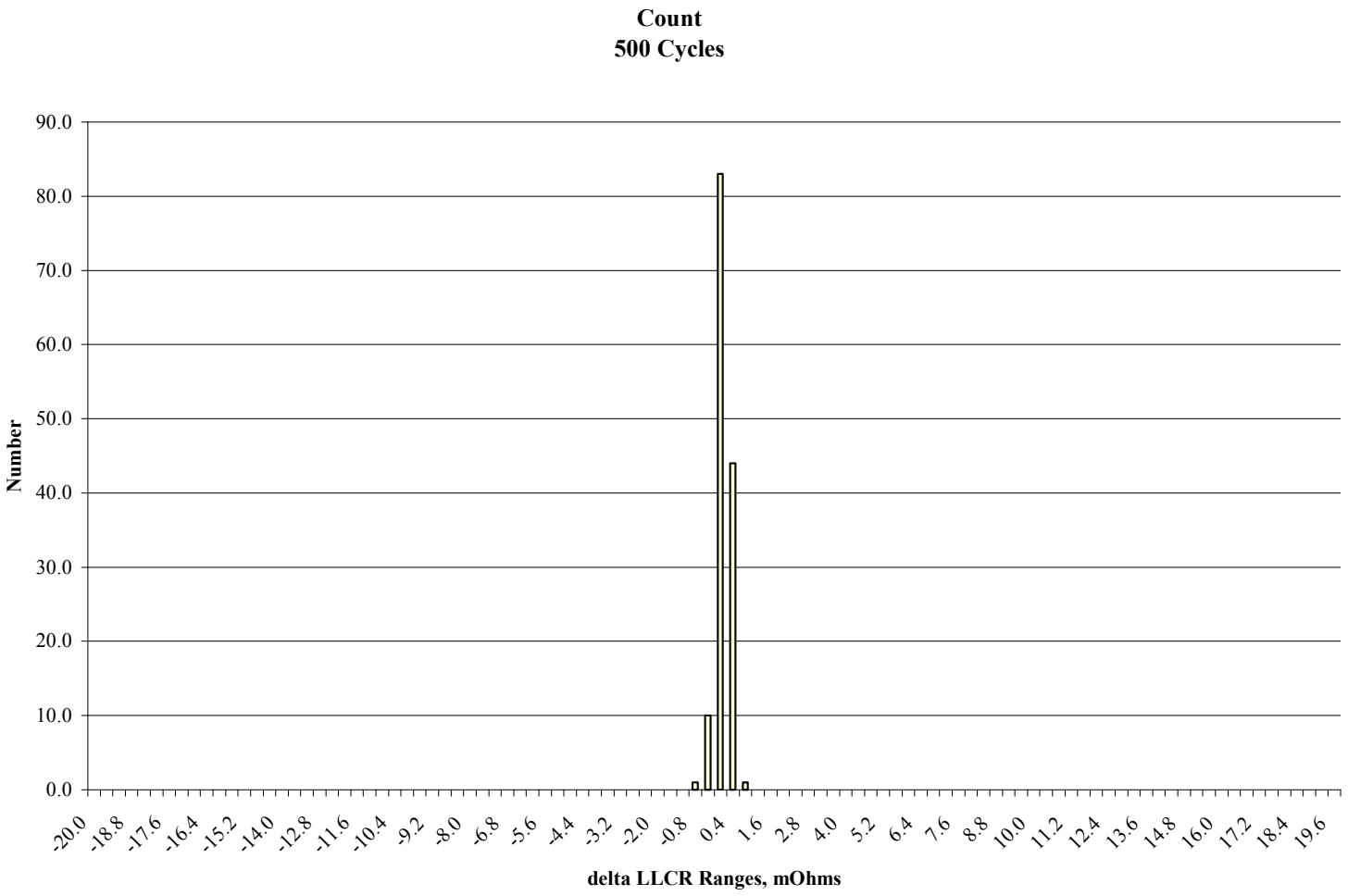
DATA SUMMARIES Continued

LLCR:

1) A total of 135 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 200 Cycles	Delta 400 Cycles	Delta 500 Cycles
Average	3.8	0.0	0.0	-0.1	-0.1
St. Dev.	0.3	0.2	0.3	0.2	0.2
Min	3.4	-0.9	-1.5	-1.1	-1.1
Max	5.0	1.3	0.5	0.5	0.5
Count	135	135	135	135	135



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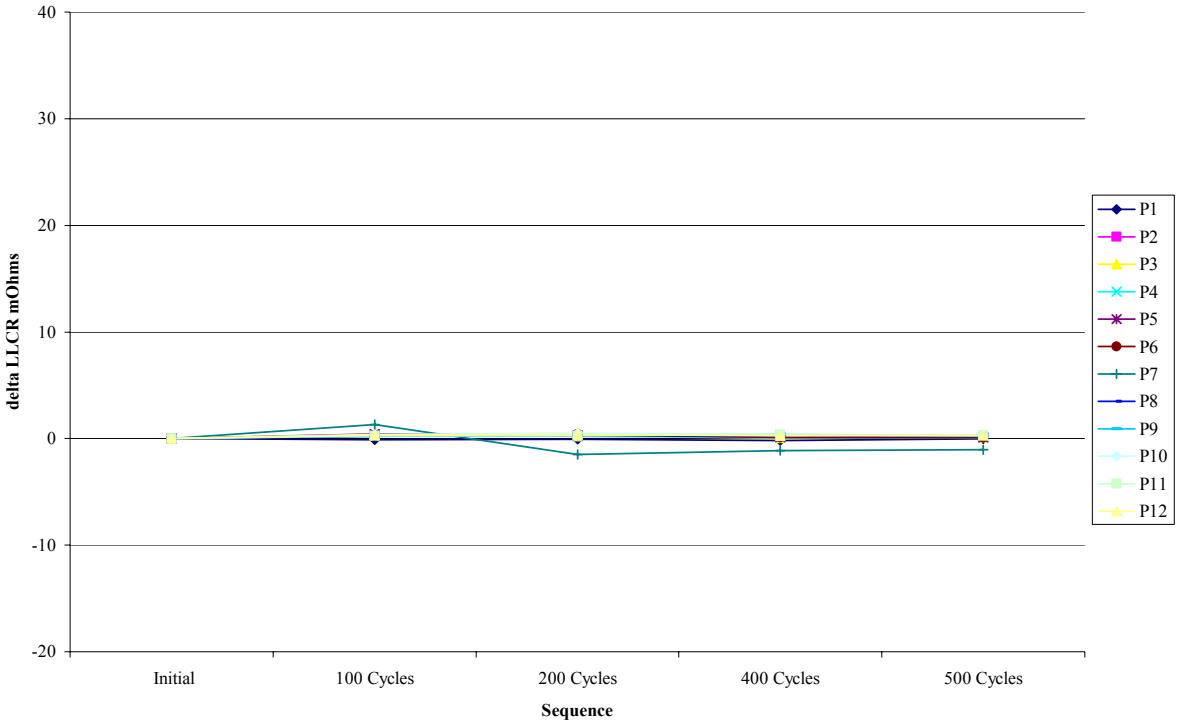
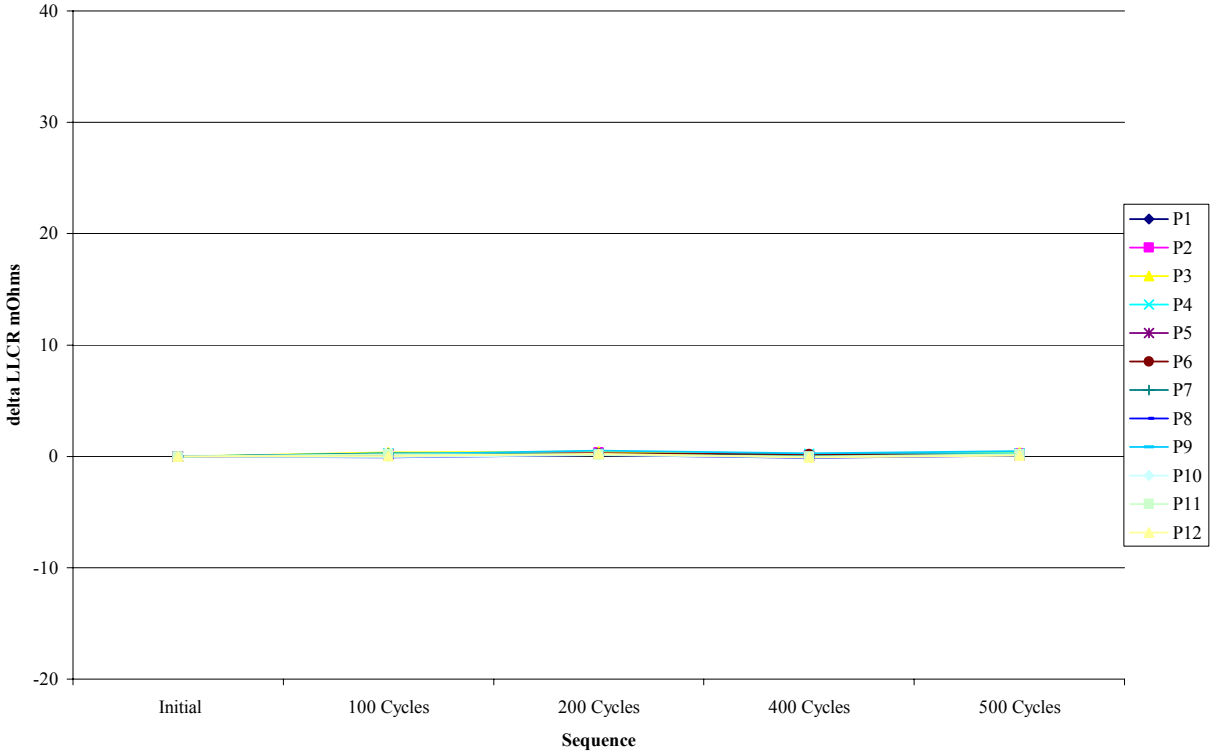
DATA SUMMARIES Continued

Board #1



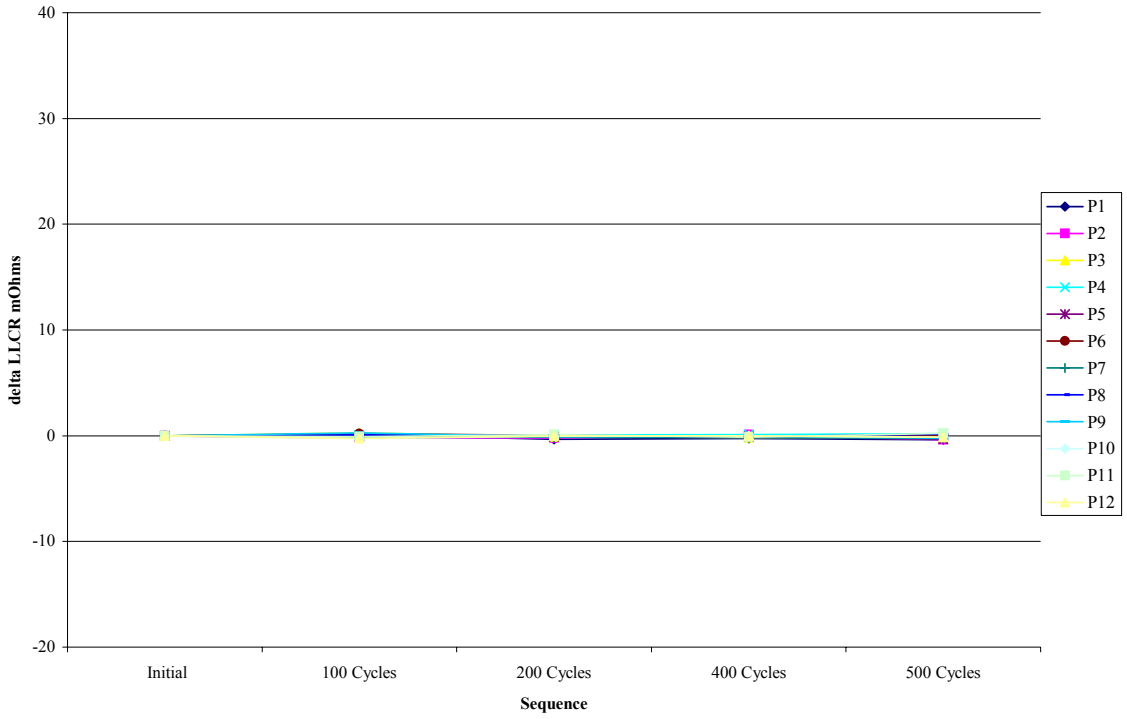
Board #2



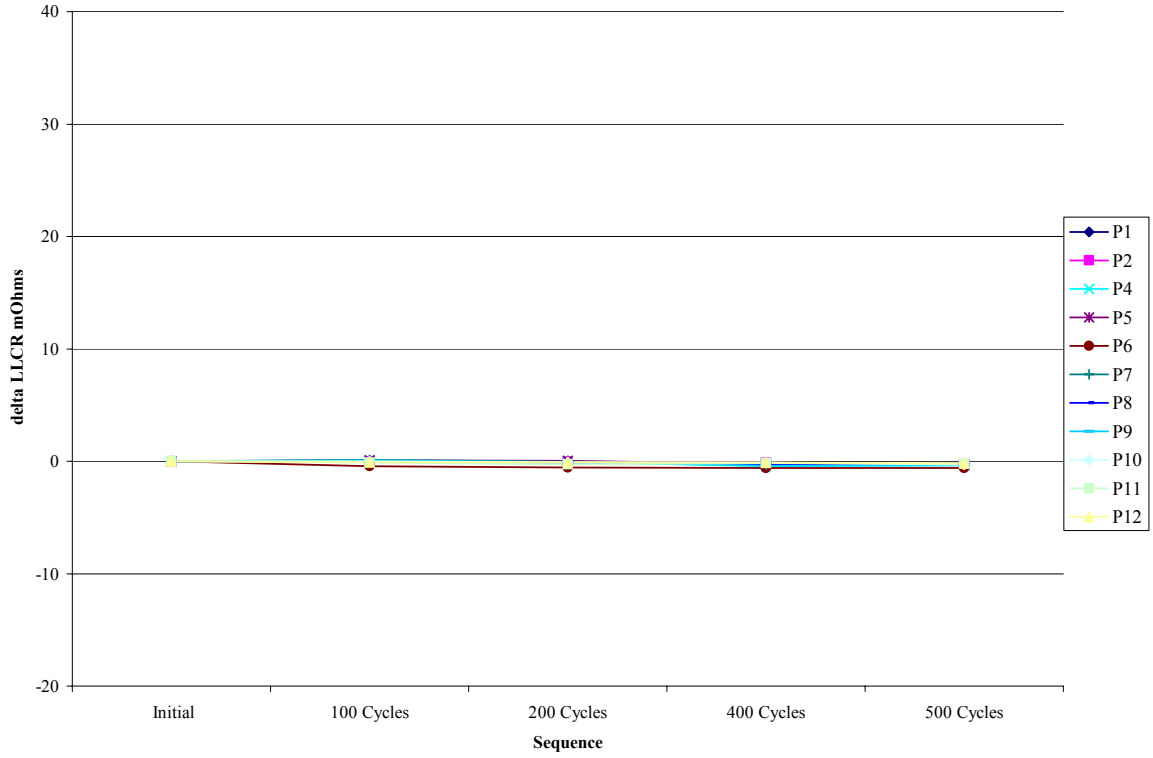
Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch	

DATA SUMMARIES Continued

Board #3



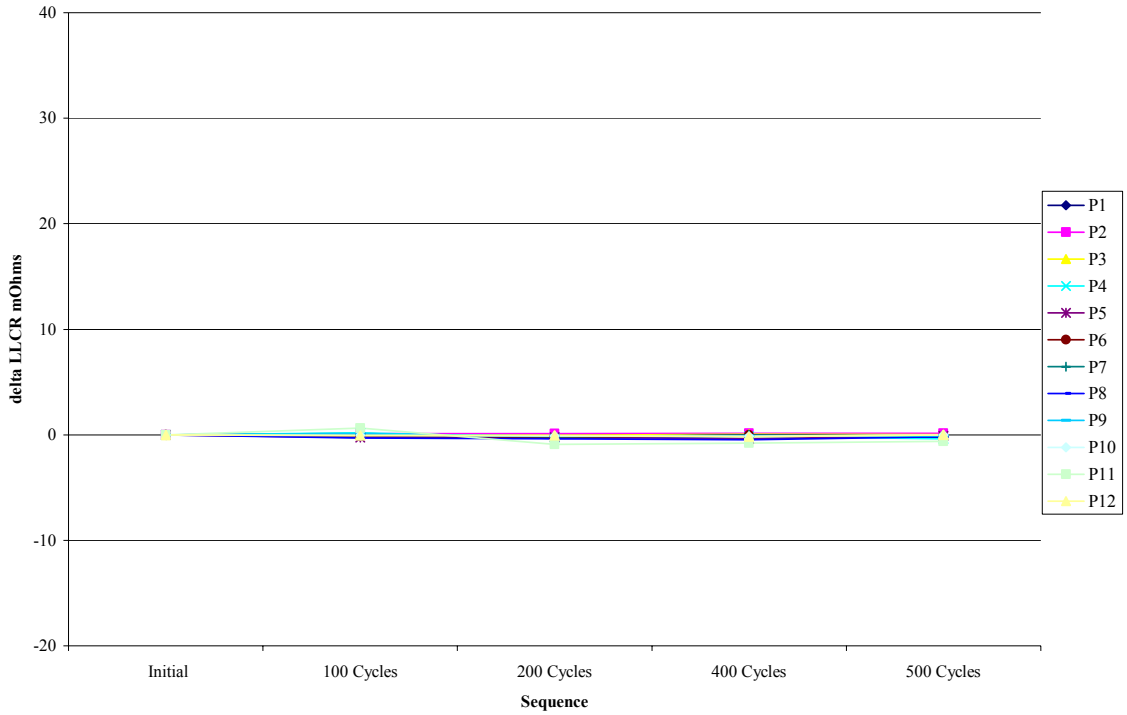
Board #4



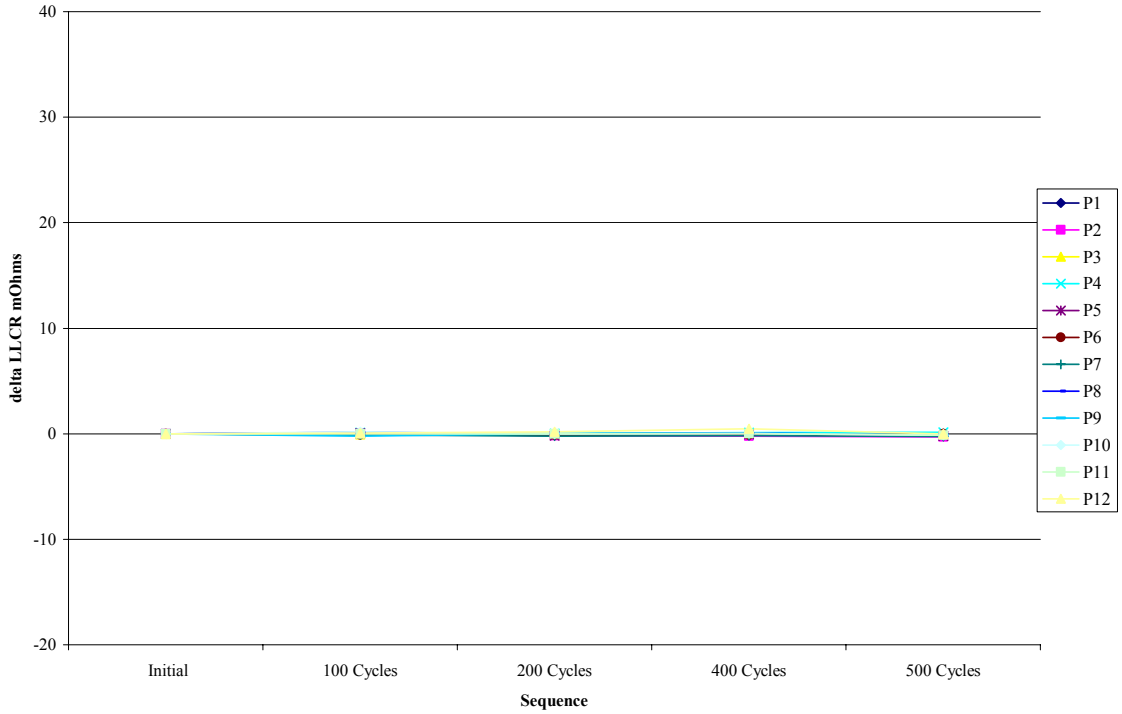
Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch	

DATA SUMMARIES Continued

Board #5



Board #6



Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
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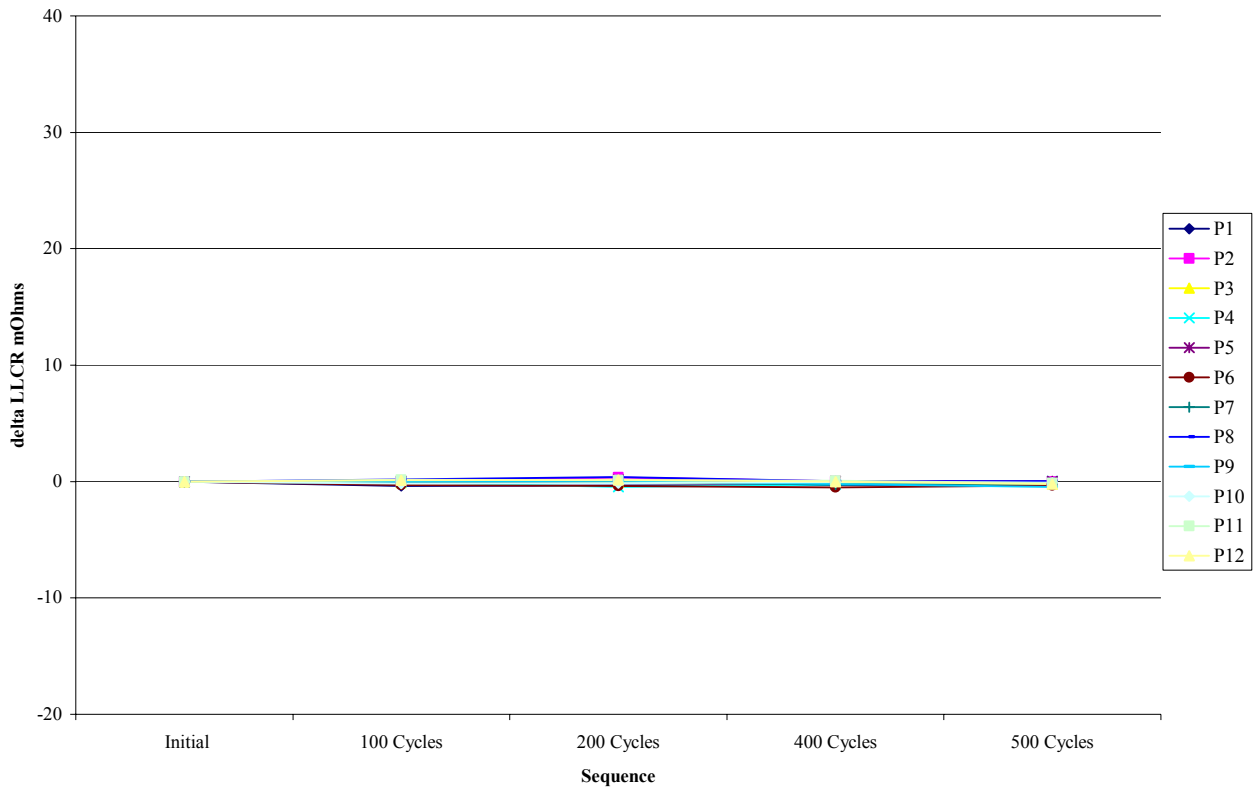
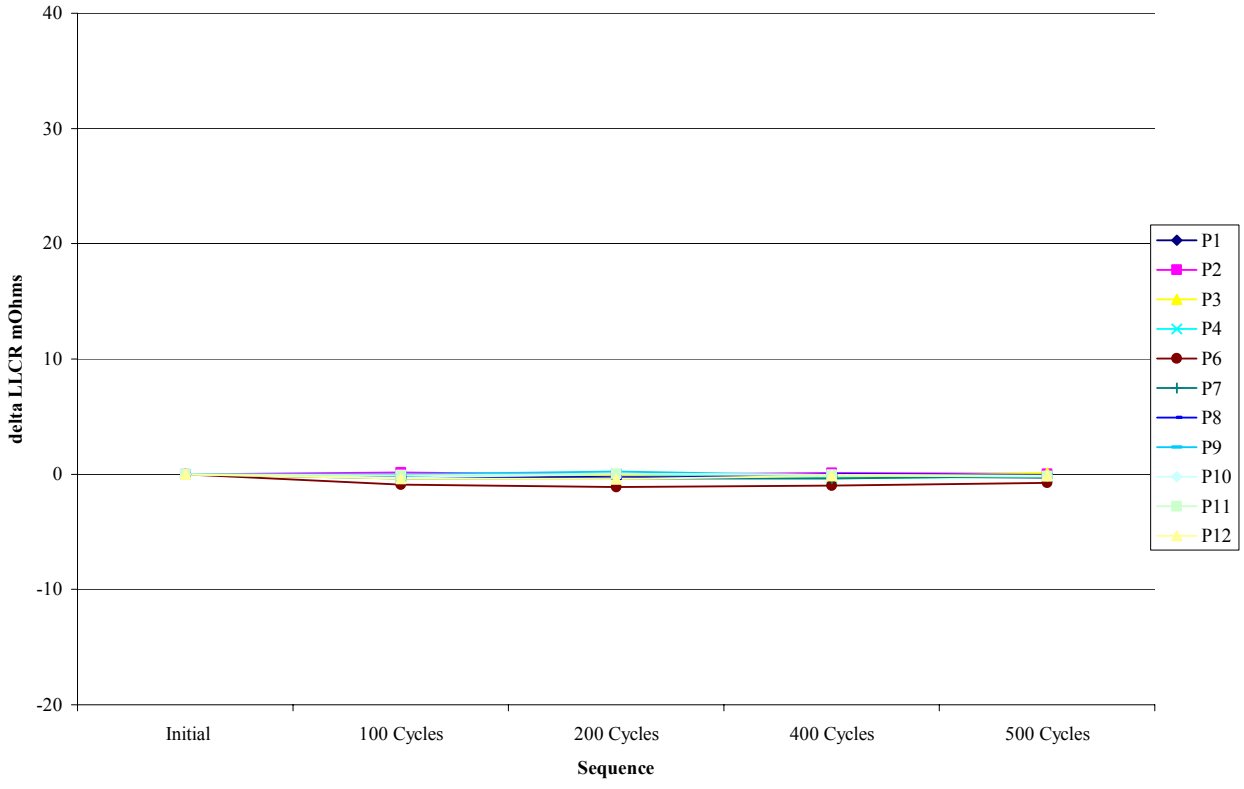
DATA SUMMARIES Continued

Board #7



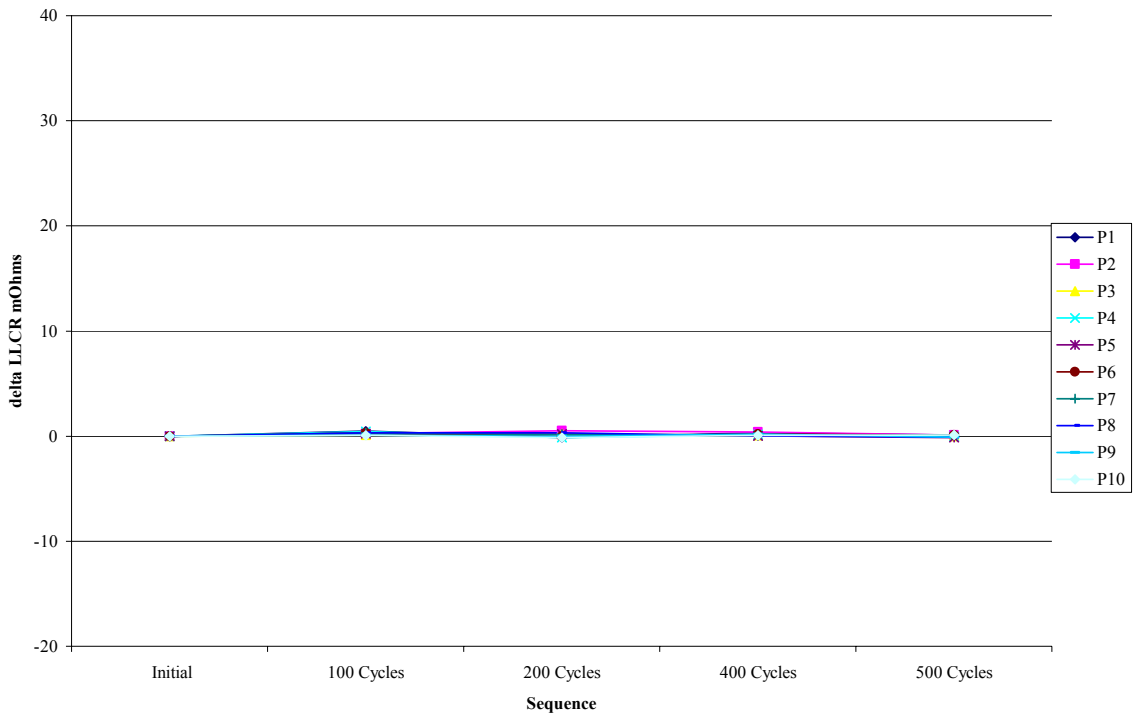
Board #8



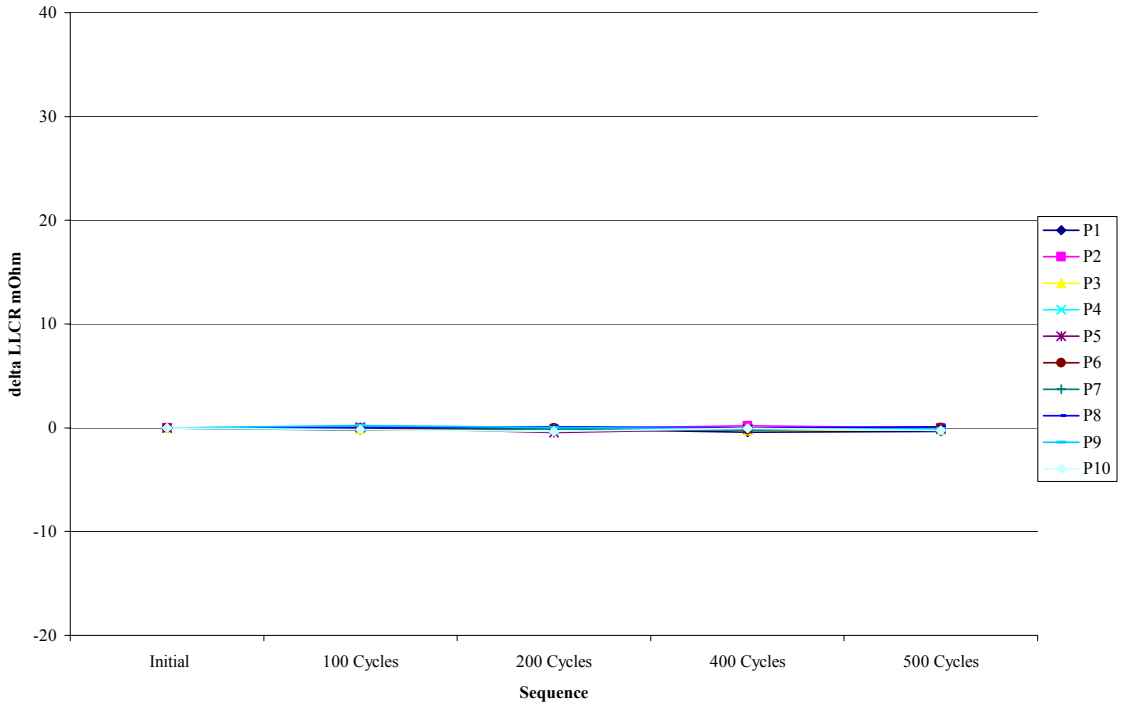
Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch	

DATA SUMMARIES Continued

Board #9



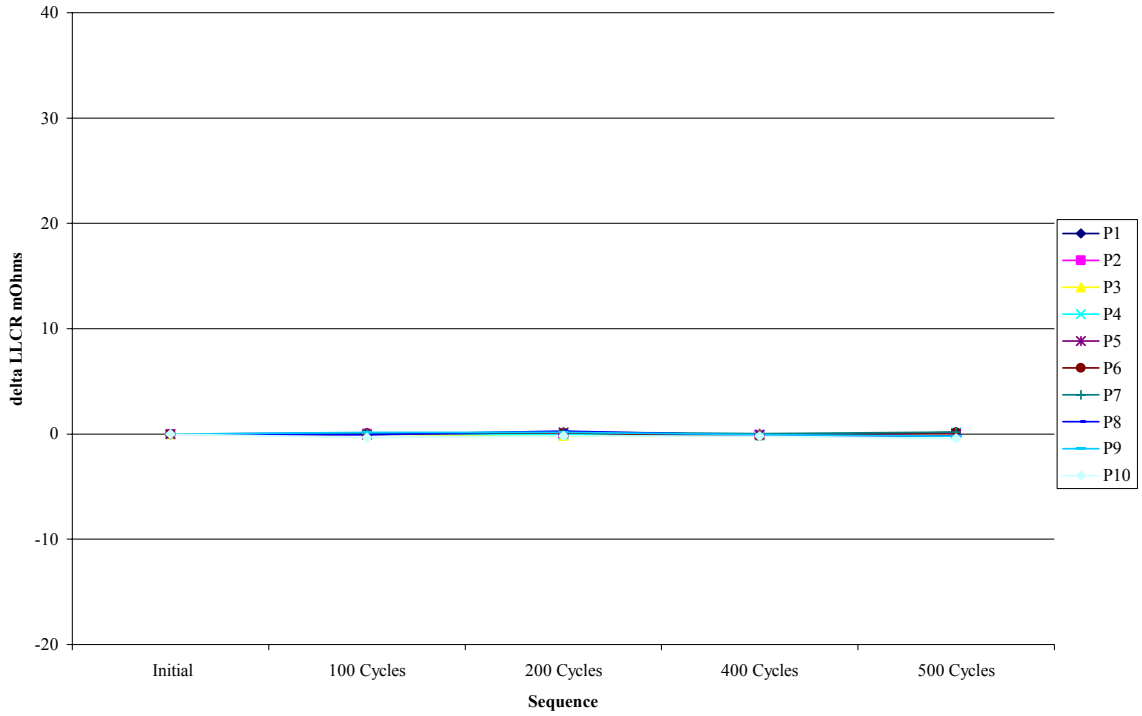
Board #10



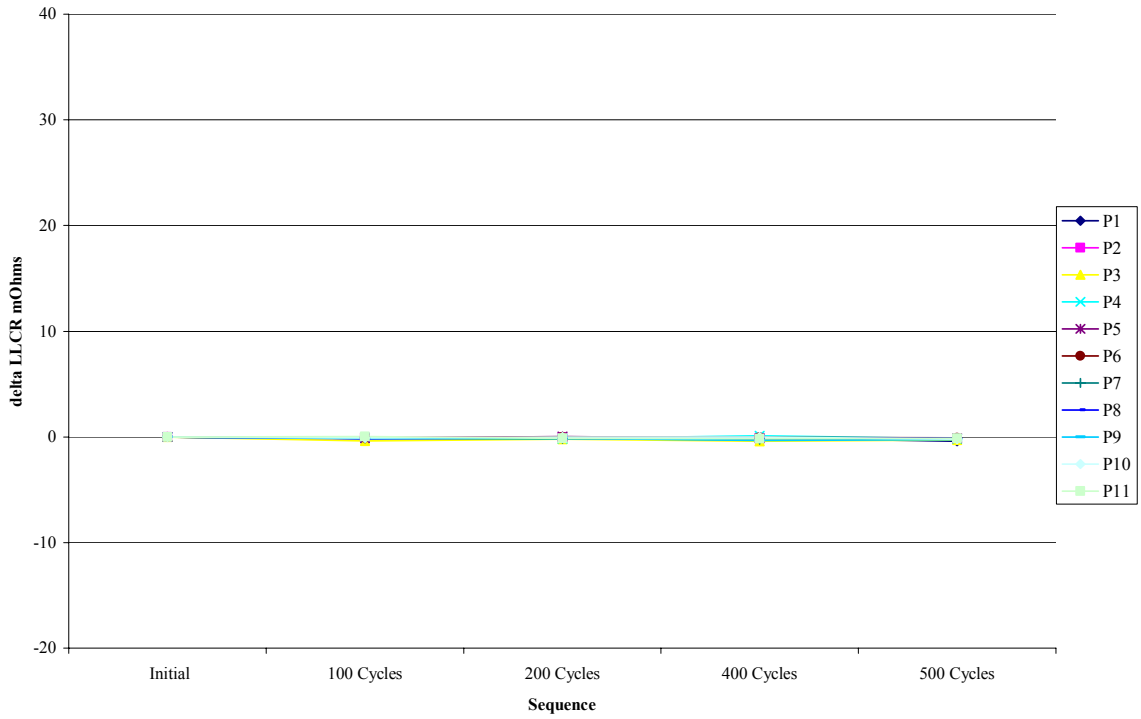
Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100” Pitch	

DATA SUMMARIES Continued

Board #11



Board #12



DATA SUMMARIES Continued

SUPPLEMENTAL TESTS

CONNECTOR PULL:

0 Degrees, Signal Lines Monitored		
Pulling off connector:	SSQ	TSS
	Force (Lbs)	Force (Lbs)
Minimum	28.85	22.39
Maximum	*44.86*	*27.59*
Average	**34.90**	**24.64**

90 degrees, Signal Lines Monitoed		
Pulling off connector:	SSQ	TSS
	Force (Lbs)	Force (Lbs)
Minimum	40.67	17.36
Maximum	*58.95*	*64.99*
Average	**50.04**	**47.75**

0 degrees, GND Monitored		
Pulling off connector:	SSQ	TSS
	Force (Lbs)	Force (Lbs)
Minimum	30.11	40.34
Maximum	*60.66*	*55.60*
Average	**52758**	**44.62**

GND 90 degrees		
Pulling off connector:	SSQ	TSS
	Force (Lbs)	Force (Lbs)
Minimum	23.65	21.47
Maximum	25.91	25.50
Average	**24.63**	**23.35**

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100" Pitch	

DATA

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Test Date:	1/23/2004
Operator:	TC
Temperature (C):	23
Humidity (RH):	37%
Equipment ID:	HPM-01

Voltage Rate ***500 VAC Per Sec.***

Test Voltage ***Until Breakdown Occurs***

Initial VAC, Sig-Sig

Sample #	Breakdown Voltage	DWV	Working Voltage
1	1700	1275	425
2	1800	1350	450

Test Date:	2/4/2004
Operator:	TR
Temperature (C):	20
Humidity (RH):	25%
Equipment ID:	HPM-01

Voltage Rate ***500 VAC Per Sec.***

Test Voltage ***Until Breakdown Occurs***

Thermal VAC, Sig-Sig

Sample #	Breakdown Voltage	DWV	Working Voltage
1	2000	1500	500
2	2000	1500	500

Test Date:	3/2/2004
Operator:	Troy Cook
Temperature (C):	23
Humidity (RH):	41%
Equipment ID:	HPM-01

Voltage Rate ***500 VAC Per Sec.***

Test Voltage ***Until Breakdown Occurs***

Humidity VAC, Sig-Sig

Sample #	Breakdown Voltage	DWV	Working Voltage
1	1500	1125	375
2	2100	1575	525

DATA Continued

INSULATION RESISTANCE (IR):

Test Date:	1/23/2004
Operator:	Troy Cook
Temperature (C):	22
Humidity (RH):	37%
Equipment ID:	HPM-01

Electrification Time ***Two (2) minutes***

Meg Ohms
Initial, Sig-Sig

Sample #	Insulation Resistance
1	50000
2	25000
3	50000
4	25000
5	50000
6	25000

Test Date:	2/6/2004
Operator:	TR
Temperature (C):	21
Humidity (RH):	33%
Equipment ID:	HPM-01

Electrification Time ***Two (2) minutes***

Meg Ohms
Thermal, Sig-Sig

Sample #	Insulation Resistance
1	50000
2	50000

Test Date:	3/2/2004
Operator:	Troy Cook
Temperature (C):	23
Humidity (RH):	41%
Equipment ID:	HPM-01

Electrification Time ***Two (2) minutes***

Meg Ohms
Humidity, Sig-Sig

Sample #	Insulation Resistance
1	25000
2	50000
3	50000
4	50000

DATA Continued

INSULATION RESISTANCE (IR):

Test Date:	1/27/2004
Operator:	Troy Cook
Temperature (C):	22
Humidity (RH):	37%
Equipment ID:	HPM-01

Electrification Time ***Two (2) minutes***

Sample #	Meg Ohms Initial, GND-Sig Insulation Resistance
1	5000
2	50000
3	25000
4	25000

Test Date:	2/9/2004
Operator:	TR
Temperature (C):	22
Humidity (RH):	23%
Equipment ID:	#REF!

Electrification Time ***Two (2) minutes***

Sample #	Meg Ohms Thermal, GND-Sig Insulation Resistance
1	100000
2	100000

Test Date:	3/2/2004
Operator:	Troy Cook
Temperature (C):	23
Humidity (RH):	41%
Equipment ID:	HPM-01

Electrification Time ***Two (2) minutes***

Sample #	Meg Ohms Humidity, GND-Sig Insulation Resistance
1	100000
2	10000
3	15000
4	25000

DATA Continued

SUPPLEMENTAL TESTS

CONNECTOR PULL, SIG LINES:

Test Date:	2/25/2004
Operator:	TR
Temperature (C):	21
Humidity (RH):	30%
Equipment ID:	TCT-03
Load Cell:	LC-2500N(icell)

0 Degrees, Signal Lines Monitored		
Sample#	Force for failure	Force for failure
1	31.03	27.59
2	31.11	22.39
3	38.83	23.48
4	28.85	24.32
5	44.86	24.99

Test Date:	2/25/2004
Operator:	TR
Temperature (C):	21
Humidity (RH):	30%
Equipment ID:	TCT-03
Load Cell:	LC-2500N(icell)

90 degrees, Signal Lines Monitoed		
Sample#	Force for failure	Force for failure
1	58.95	36.90
2	51.07	63.40
3	40.67	64.99
4	54.68	55.85
5	44.86	17.36

DATA Continued

SUPPLEMENTAL TESTS

CONNECTOR PULL, GND:

Test Date:	2/25/2004
Operator:	TR
Temperature (C):	21
Humidity (RH):	30%
Equipment ID:	TCT-03
Load Cell:	LC-2500N(icell)

0 degrees, GND Monitored		
Sample#	Force for failure	Force for failure
1	55.60	40.34
2	30.11	44.28
3	60.66	40.86
4	60.29	41.68
5	57.53	55.60

Test Date:	2/25/2004
Operator:	TR
Temperature (C):	21
Humidity (RH):	30%
Equipment ID:	TCT-03
Load Cell:	LC-2500N(icell)

GND 90 degrees		
Sample#	Force for failure	Force for failure
1	23.65	21.89
2	24.91	25.50
3	24.32	24.40
4	25.91	21.47
5	24.24	23.56

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100" Pitch	

DATA Continued

LLCR:

Date	Jan. 14 2004	Jan. 14 2004	Jan. 19 2004	Jan. 22 2004	Jan. 23 2004
Room Temp C	23	21	23	22	23
RH	23%	29%	21%	23%	24%
Name	Tim Receveur	Tim Receveur	Tim Receveur	Troy Cook	Tim Receveur

mOhm values		Actual	Delta	Delta	Delta	Delta
Board	Position	Initial	100 Cycles	200 Cycles	400 Cycles	500 Cycles
1	P1	3.8	-0.1	-0.1	-0.2	0.0
1	P2	3.4	0.3	0.2	0.2	0.2
1	P3	3.4	0.3	0.2	0.0	0.1
1	P4	3.4	0.3	0.2	0.1	0.1
1	P5	3.7	0.4	0.3	0.1	0.1
1	P6	3.5	0.2	0.4	0.1	0.1
1	P7	5.0	1.3	-1.5	-1.1	-1.1
1	P8	3.4	0.3	0.3	0.3	0.3
1	P9	3.5	0.2	0.3	0.4	0.2
1	P10	3.4	0.4	0.5	0.4	0.3
1	P11	3.6	0.3	0.2	0.4	0.3
1	P12	3.5	0.3	0.4	0.3	0.3
2	P1	3.9	0.1	0.3	0.0	0.1
2	P2	3.8	0.2	0.4	0.1	0.3
2	P3	3.9	0.3	0.4	0.1	0.4
2	P4	3.8	0.3	0.2	0.2	0.3
2	P5	3.5	0.2	0.2	0.0	0.1
2	P6	3.9	0.2	0.3	0.2	0.2
2	P7	3.7	0.3	0.2	0.0	0.1
2	P8	4.0	-0.1	0.1	-0.1	0.1
2	P9	3.8	0.2	0.5	0.3	0.5
2	P10	4.0	-0.1	0.1	-0.1	0.1
2	P11	4.0	0.2	0.2	0.0	0.2
2	P12	3.7	0.0	0.2	-0.1	0.1
3	P1	4.0	0.1	-0.3	-0.3	-0.4
3	P2	3.9	-0.2	-0.2	0.1	-0.4
3	P3	3.7	0.3	-0.1	-0.2	-0.2
3	P4	3.8	0.1	0.1	0.1	0.2
3	P5	3.8	-0.1	-0.1	-0.1	-0.3
3	P6	3.7	0.2	0.0	-0.1	0.0
3	P7	3.9	-0.2	-0.1	-0.2	-0.3
3	P8	3.5	0.1	0.0	-0.1	0.2
3	P9	3.9	0.3	-0.1	-0.1	-0.2
3	P10	3.9	-0.3	-0.1	0.0	-0.1
3	P11	3.6	-0.1	0.1	-0.1	0.2
3	P12	4.0	-0.3	0.0	0.0	-0.1

4	P1	4.2	0.0	-0.1	-0.1	-0.3
4	P2	3.9	0.0	0.0	-0.1	-0.3
4	P4	4.3	0.0	0.0	-0.4	-0.4
4	P5	3.7	0.1	0.0	-0.3	-0.3
4	P6	4.2	-0.4	-0.5	-0.6	-0.6
4	P7	3.8	0.1	0.0	-0.3	-0.2
4	P8	4.0	0.0	-0.1	-0.3	-0.3
4	P9	4.0	0.1	-0.1	-0.4	-0.4
4	P10	4.0	0.0	-0.1	-0.1	-0.3
4	P11	4.2	-0.1	-0.3	-0.2	-0.3
4	P12	4.2	-0.1	-0.1	-0.1	-0.2
5	P1	3.9	0.1	-0.3	-0.1	-0.2
5	P2	3.7	0.1	0.1	0.2	0.2
5	P3	3.6	0.0	-0.1	0.1	0.0
5	P4	3.8	0.2	-0.2	-0.1	-0.4
5	P5	3.9	-0.3	-0.2	-0.4	-0.1
5	P6	4.4	-0.1	-0.3	0.0	-0.1
5	P7	3.9	0.0	-0.2	0.0	-0.1
5	P8	3.9	-0.3	-0.4	-0.5	-0.2
5	P9	4.0	0.1	-0.1	-0.1	-0.1
5	P10	3.9	-0.1	-0.1	-0.2	0.0
5	P11	4.5	0.6	-0.9	-0.8	-0.6
5	P12	3.7	-0.1	-0.1	-0.2	0.0
6	P1	3.6	0.1	-0.1	0.1	0.0
6	P2	4.3	0.0	-0.2	-0.2	-0.3
6	P3	3.7	0.0	0.0	0.1	0.0
6	P4	3.4	0.1	0.0	0.1	0.2
6	P5	3.7	0.1	-0.2	0.0	-0.2
6	P6	3.5	-0.1	-0.1	-0.1	0.0
6	P7	4.0	-0.1	-0.2	-0.2	-0.3
6	P8	3.9	0.1	0.0	0.1	-0.1
6	P9	3.9	-0.2	0.0	0.1	-0.1
6	P10	3.7	0.2	0.0	0.0	-0.1
6	P11	3.7	0.0	0.0	0.0	-0.1
6	P12	3.7	0.1	0.2	0.5	0.0
7	P1	3.9	-0.4	-0.4	-0.3	-0.2
7	P2	3.7	0.0	0.4	0.0	0.0
7	P3	3.8	-0.1	-0.1	-0.1	-0.2
7	P4	3.9	0.0	-0.5	-0.2	0.0
7	P5	3.4	0.0	0.2	0.0	0.0
7	P6	3.8	-0.3	-0.4	-0.5	-0.4
7	P7	3.8	-0.2	0.0	-0.3	-0.2
7	P8	3.5	0.2	0.4	0.0	0.0
7	P9	3.8	0.0	0.1	-0.2	-0.4
7	P10	3.8	-0.2	-0.1	-0.1	-0.1
7	P11	3.6	0.1	0.1	0.1	-0.1
7	P12	3.7	0.1	0.1	0.0	-0.2
8	P1	4.0	-0.3	-0.1	-0.2	-0.3
8	P2	3.9	0.1	0.0	0.1	0.0
8	P3	3.9	-0.2	-0.1	-0.2	0.1

8	P4	3.8	-0.2	0.0	-0.3	-0.2
8	P6	4.6	-0.9	-1.1	-1.0	-0.7
8	P7	4.0	-0.4	-0.4	-0.4	-0.1
8	P8	4.0	-0.3	-0.4	0.0	0.0
8	P9	4.0	0.0	0.2	-0.1	-0.1
8	P10	3.8	-0.3	0.0	-0.1	-0.1
8	P11	3.8	-0.1	0.0	0.0	-0.2
8	P12	4.4	-0.4	-0.4	-0.1	-0.1
9	P1	3.8	0.5	-0.1	0.3	0.1
9	P2	3.4	0.2	0.5	0.4	0.1
9	P3	3.6	0.1	0.2	0.1	0.0
9	P4	3.6	0.4	-0.1	0.1	-0.1
9	P5	3.6	0.2	0.2	0.0	-0.2
9	P6	3.6	0.3	0.0	0.2	0.1
9	P7	3.5	0.3	0.1	0.1	0.1
9	P8	3.7	0.3	0.3	0.0	-0.1
9	P9	3.9	0.1	0.0	0.2	-0.1
9	P10	3.8	0.0	-0.1	0.1	0.1
10	P1	4.0	-0.2	-0.1	-0.4	-0.3
10	P2	3.7	0.0	-0.1	0.2	0.0
10	P3	3.7	-0.1	-0.1	-0.2	-0.2
10	P4	3.9	0.1	-0.1	-0.1	-0.1
10	P5	4.0	0.0	-0.5	-0.1	-0.1
10	P6	3.8	-0.1	0.0	-0.2	0.0
10	P7	3.8	-0.2	-0.1	-0.2	0.0
10	P8	4.0	0.0	0.1	0.0	0.1
10	P9	3.9	0.2	0.0	-0.1	-0.1
10	P10	4.2	-0.2	-0.3	-0.1	-0.3
11	P1	3.8	0.1	-0.1	-0.2	-0.1
11	P2	3.8	0.0	-0.1	-0.1	0.1
11	P3	3.9	0.0	-0.2	-0.1	0.0
11	P4	3.9	0.0	-0.1	-0.2	0.1
11	P5	3.7	0.0	0.1	0.0	0.0
11	P6	3.4	0.0	0.1	-0.2	0.2
11	P7	3.4	0.0	0.2	0.0	0.2
11	P8	3.6	-0.1	0.3	-0.1	-0.2
11	P9	3.7	0.1	0.2	0.0	-0.2
11	P10	4.2	-0.3	-0.2	-0.2	-0.4
12	P1	4.1	-0.1	-0.1	-0.1	-0.4
12	P2	3.7	-0.1	0.0	-0.1	-0.2
12	P3	3.8	-0.4	-0.2	-0.4	-0.3
12	P4	3.9	-0.1	-0.2	0.1	-0.2
12	P5	3.8	-0.1	0.0	-0.1	-0.1
12	P6	3.8	-0.1	0.0	-0.1	-0.1
12	P7	4.0	-0.1	-0.2	-0.3	-0.1
12	P8	4.0	-0.2	-0.1	-0.1	-0.1
12	P9	3.9	-0.1	-0.1	-0.3	-0.3
12	P10	3.8	-0.1	0.0	0.0	-0.2
12	P11	4.0	0.0	-0.2	-0.2	-0.1

Tracking Code: TC0345--0310	Part #: HHSC-108-10.00-TD-SE
Part description: JTAG Micro Co-ax Cable Assy, 0.100" Pitch	

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: THL-02
Description: Temperature/Humidity Chart Recorder
Manufacturer: Dickson
Model: THDX
Serial #: 00120351
Accuracy: Temp: +/- 1C; Humidity: +/-2% RH (0 - 60%) +/- 3% RH (61 - 95%).
… Last Cal: 6/17/03, Next Cal: 6/31/04

Equipment #: MO-02
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0780546
Accuracy: See Manual
… Last Cal6/12/03, Next Cal: 6/12/04

Equipment #: MO-04
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0798688
Accuracy: See Manual
… Last Cal: 6/12/03, Next Cal: 6/12/04

Equipment #: PS-01
Description: System Power Supply
Manufacturer: Hewlett Packard
Model: HP 6033A
Serial #: (HP) 3329A-07330
Accuracy: See Manual 10/16/02
… Last Cal: 6/12/03, Next Cal: 6/12/04

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

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 6/12/03, Next Cal: 6/12/04

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: 6/20/03, Next Cal: 6/30/04

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 5/28/2003, Next Cal: 5/28/2004

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: 6/12/03, Next Cal: 6/12/04

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 #: MO-01
Description: Micro-Ohmeter
Manufacturer: Keithley
Model: 580
Serial #: 00120351
Accuracy: See Manual
… Last Cal: 6/12/03, Next Cal: 6/12/04