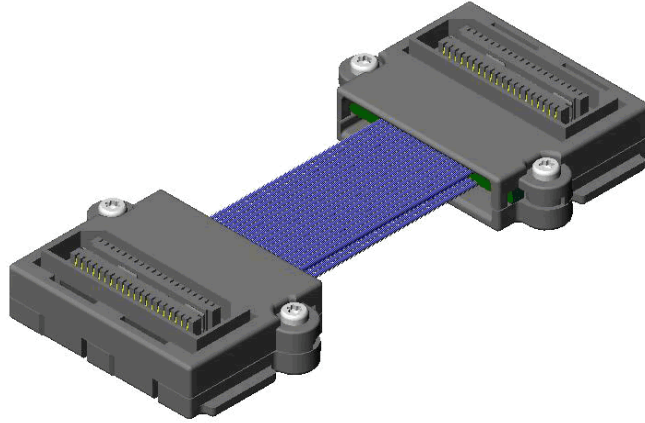




Project Number:	Tracking Code: TC0345--0308		
Requested by: John Reid	Date: 11/4/2003	Product Rev: 5	
Part #: EQCD -DV to DV, phase B DVT testing	Lot #: 11/4/03	Tech: TC & TR	Eng: John Tozier
Part description: Micro Co-ax High Speed Cable Assy, 0.8 mm Pitch			Qty to test: 50
Test Start: 01/21/2004	Test Completed: 3/2/2004		



Phase B DVT testing

PART DESCRIPTION

EQCD -DV to DV, phase B DVT testing

Mated with QTE

CERTIFICATION

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

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SCOPE

To perform the following tests: Phase B DVT testing

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR 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

FLOWCHARTS

TEST	GROUP 1-X-Over	GROUP 2	GROUP 3	GROUP 4
STEP	TOP Cable	Cable Center Both Cables Powered, at 95° C	GND, On X-Over Board	GND, Cable Center Both Cables Powered, at 95° C
	6 Contacts	6 Contacts		
01	CCC	CCC	CCC	CCC

Tabulate calculated current at RT, 75° C, 80° C and 95° C
after derating 20% and based on 105° C Cable Limit
CCC, Temp rise = EIA-364-70

TEST	GROUP 1A-X-Over	GROUP 1B-X-Over
	TOP-BOTTOM Cable	TOP-BOTTOM Cable
STEP	EQCD	EQCD
01	IR	IR
02	Data Review	Data Review
03	Thermal Aging	Gas Tight
04	IR	IR
05	Data Review	
06	Humidity	
07	IR	

Thermal Aging = EIA-364-17, Test Condition 4, 105 deg C;

Time Condition 'B' (250 hours)

Humidity =EIA-364-31, Test Condition B (240 Hours)

and Method III (+25 ° C to +65 ° C @ 90%RH to 98% RH)

delete steps 7a and 7b

Gas Tight = EIA-364-36A

FLOWCHARTS Continued

TEST	GROUP 1A-X-Over	GROUP 1B-X-Over	GROUP 1C-X-Over	GROUP 1D-STD
STEP	TOP Cable	TOP Cable	TOP Cable	TOP Cable
	Ambient	Thermal	Humidity	Gas Tight
01	DWV/Working Voltage	Thermal Aging	Humidity	Gas Tight
02		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 98% RH)			
	delete steps 7a and 7b			
	Gas Tight = EIA-364-36A			

TEST	GROUP 1A-X-Over	GROUP 1B-X-Over
STEP		
	Sig 0°	Sig 90°
01	Pull test, Continuity	Pull test, Continuity
	Secure both cables in the center	
	Monitor continuity and pull	
	record forces when continuity fails.	

TEST	GROUP 1-X-Over
STEP	
01	Pull test, Mechanical
	Record MAX force

FLOWCHARTS Continued

TEST STEP	GROUP 1A-X-Over	GROUP 1B-X-Over
	Sig ±90° Bend	Sig ±35° Bend
01	Resistance	Resistance
02	5000 Cycles	5000 Cycles
03	Data Review	Data Review
04	Resistance	Resistance
05	10000 Cycles	10000 Cycles
06	Data Review	Data Review
07	Resistance	Resistance
08	15000 Cycles	15000 Cycles
09	Data Review	Data Review
10	Resistance	Resistance
11	20000 Cycles	20000 Cycles
12	Data Review	Data Review
13	Resistance	Resistance
14	25000 Cycles	25000 Cycles
15	Resistance	Resistance

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) 75° C
 - c) 80° C
 - d) 95° 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) Mated
 - iii) Mounted
 - iv) Rate of Application 500 V/Sec

- v) 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) Mated
 - iii) Mounted
 - iv) Electrification Time 2.0 minutes
 - v) 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.

GAS TIGHT:

To provide method for evaluating the ability of the electrical system to withstand harsh vapors which might lead to oxide formation that may degrade the electrical performance of the electrical system.

- 1) Procedure:
 - a) Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
 - b) Test Conditions:
 - i) Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
 - ii) The ratio of the volume of the test chamber to the surface area of the acid shall be less than 10.
 - iii) The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
 - iv) Exposure time – 55 to 65 minutes.
 - v) The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
 - vi) The samples shall be dried after exposure for a minimum of 1 hour.
 - vii) Drying temperature 50 °C
 - viii) The final measurements shall be conducted within 1 hour after drying.

SUPPLEMENTAL TESTS**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

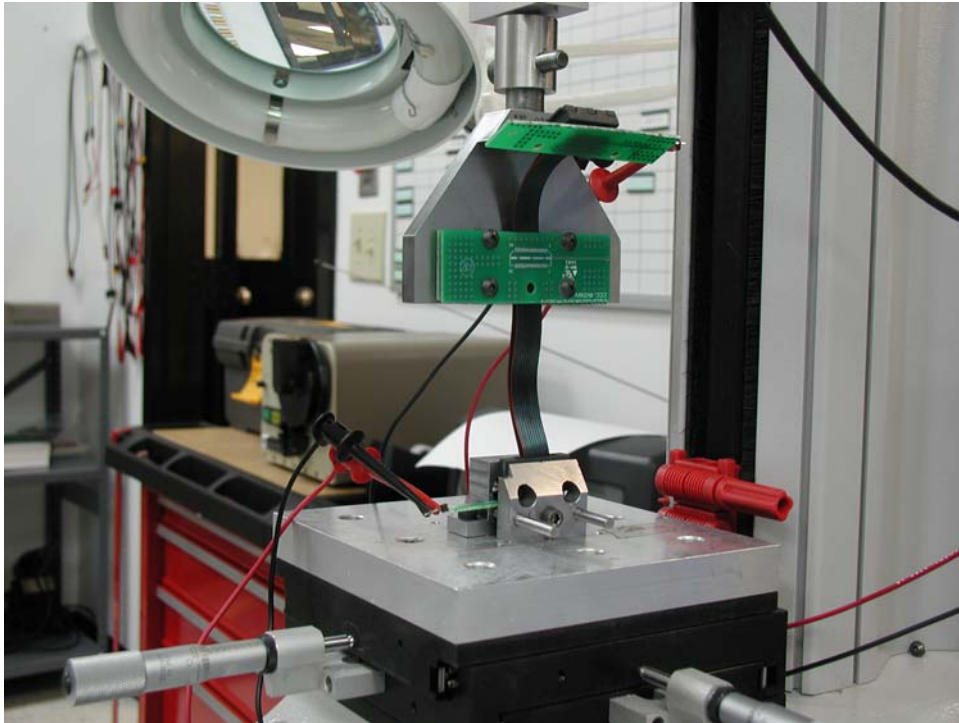
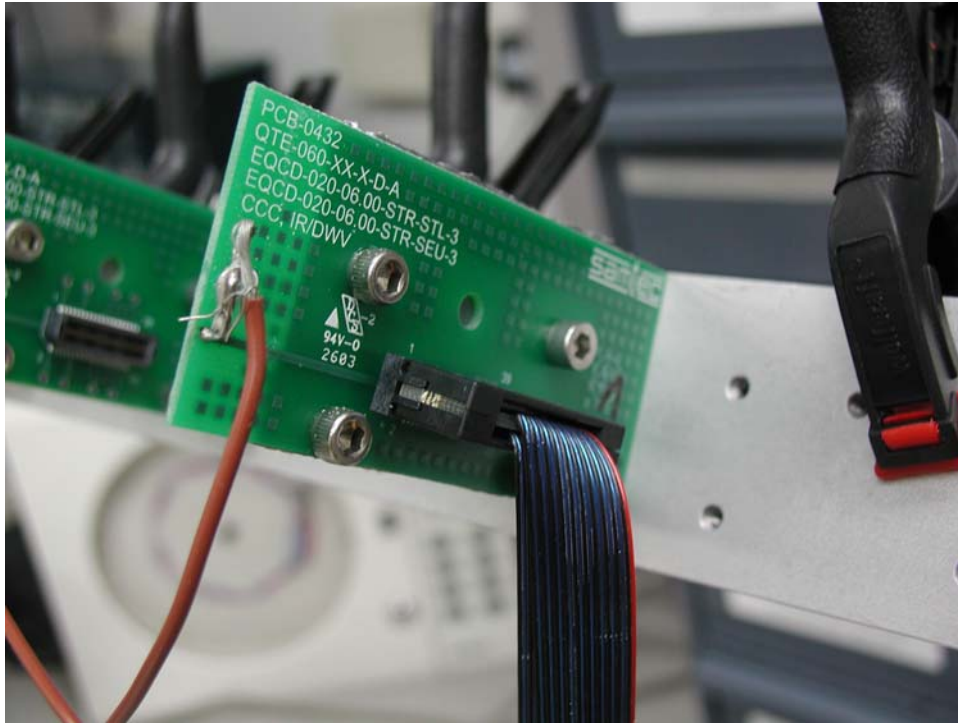


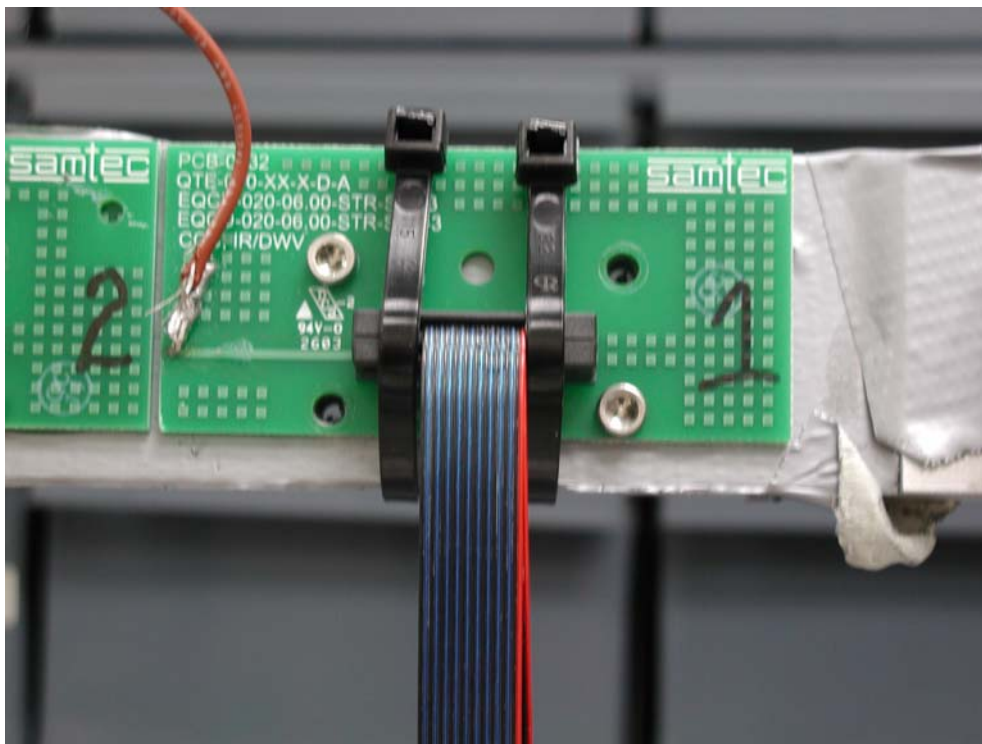
Fig 1
0° Connector pull. Notice the electrical continuity hook-up wires.

SUPPLEMENTAL TESTS Continued**CONNECTOR DURABILITY:**

- 1) Bend up to 25,000 cycles with 8 oz. load on cable end
 - a) $\pm 35^\circ$, Pendulum Mode



- b) $\pm 90^\circ$, Flex Mode



RESULTS**Temperature Rise, CCC at 20% de-rated**

- **At 90C, relative to 105C**
 - **With 6 adjacent Signal Lines powered**
 - Measured at PC board ----- 0.35A
 - Measured in center of cable ----- 0.28A
 - **With Ground Plane Powered**
 - Measured at PC board ----- 4.5A
 - Measured in center of cable ----- 6.0A

Dielectric Withstanding Voltage minimums, DWV

- **Initial**
 - **Breakdown**
 - **Mated**
 - Top-----850 VAC
 - Bottom ----- 1300 VAC
 - **Unmated**
 - Top----- 1100 VAC
 - Bottom ----- 1200 VAC
 - **DWV**
 - **Mated**
 - Top-----638 VAC
 - Bottom -----975 VAC
 - **Unmated**
 - Top-----825 VAC
 - Bottom -----900 VAC
 - **Working voltage**
 - **Mated**
 - Top-----213 VAC
 - Bottom -----325 VAC
 - **Unmated**
 - Top-----275 VAC
 - Bottom -----300 VAC
- **Thermal**
 - **Breakdown**
 - **Mated**
 - Top----- 1000 VAC
 - Bottom ----- 1300 VAC
 - **Unmated**
 - Top----- 1200 VAC
 - Bottom ----- 1400 VAC
 - **DWV**
 - **Mated**
 - Top-----750 VAC
 - Bottom -----975 VAC
 - **Unmated**
 - Top-----900 VAC
 - Bottom -----1050 VAC
 - **Working voltage**
 - **Mated**
 - Top-----250 VAC
 - Bottom -----325 VAC
 - **Unmated**
 - Top-----300 VAC
 - Bottom -----350 VAC

- **Humidity**
 - **Breakdown**
 - **Mated**
 - Top-----700 VAC
 - Bottom ----- 1000 VAC
 - **Unmated**
 - Top----- 1000 VAC
 - Bottom ----- 1200 VAC
 - **DWV**
 - **Mated**
 - Top-----525 VAC
 - Bottom -----750 VAC
 - **Unmated**
 - Top-----750 VAC
 - Bottom -----900 VAC
 - **Working voltage**
 - **Mated**
 - Top-----175 VAC
 - Bottom -----250 VAC
 - **Unmated**
 - Top-----250 VAC
 - Bottom -----300 VAC

Insulation Resistance minimums, IR

- **Initial**
 - **Mated**
 - Top -----75,000 Meg Ω ----- Pass
 - Bottom -----5,000 Meg Ω ----- Pass
 - **Unmated**
 - Top -----100,000 Meg Ω ----- Pass
 - Bottom -----5,500 Meg Ω ----- Pass
- **Thermal**
 - **Mated**
 - Top -----35,000 Meg Ω
 - Bottom -----35,000 Meg Ω
 - **Unmated**
 - Top -----50,000 Meg Ω
 - Bottom -----50,000 Meg Ω
- **Humidity**
 - **Mated**
 - Top -----25,000 Meg Ω
 - Bottom -----25,000 Meg Ω
 - **Unmated**
 - Top -----50,000 Meg Ω
 - Bottom -----50,000 Meg Ω

Supplementary Testing

DWV Gas Tight, Un-mated

- **Initial**
 - **Breakdown** ----- 1700 VAC
 - **DWV** ----- 1275 VAC
 - **Working voltage**-----425 VAC

- **Gas Tight**
 - **Breakdown** -----950 VAC
 - **DWV**-----713 VAC
 - **Working voltage**-----238 VAC

IR Gas Tight, Un-mated

- **Initial**-----6000 Meg Ω ----- Pass
- **Gas Tight**-----1000 Meg Ω

Connector/Cable Pull, Monitored for Signal Continuity

- **0°**-----84.28 lbs min
- **90°**-----72.29 lbs min

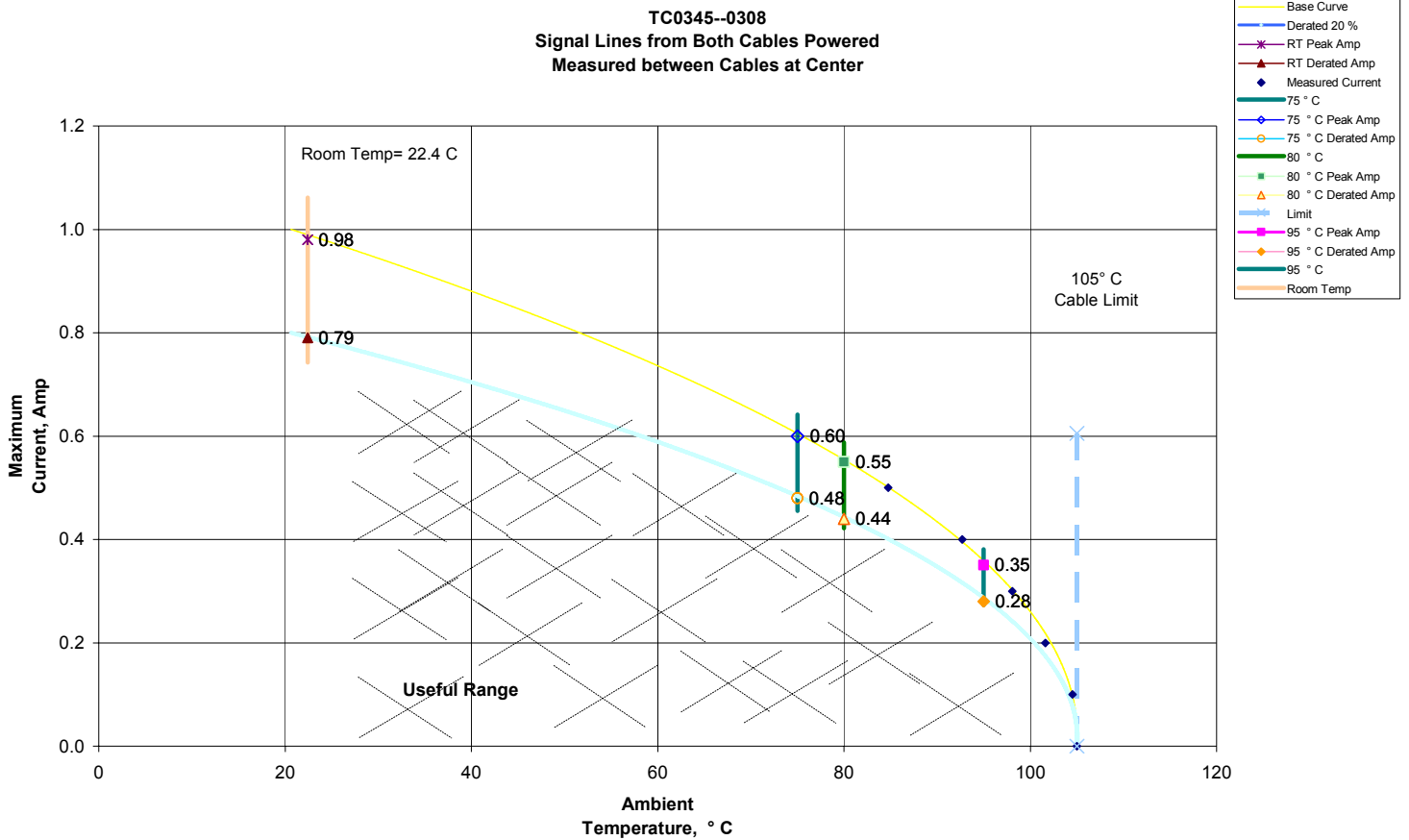
Cable Flex 25,000 Cycles, Monitored for Signal Continuity

- **35° Pendulum Mode**----- No Electrical Failures at 25,000 Cycles
- **90°**----- Electrical Failure at 6639 Cycles

DATA SUMMARIES

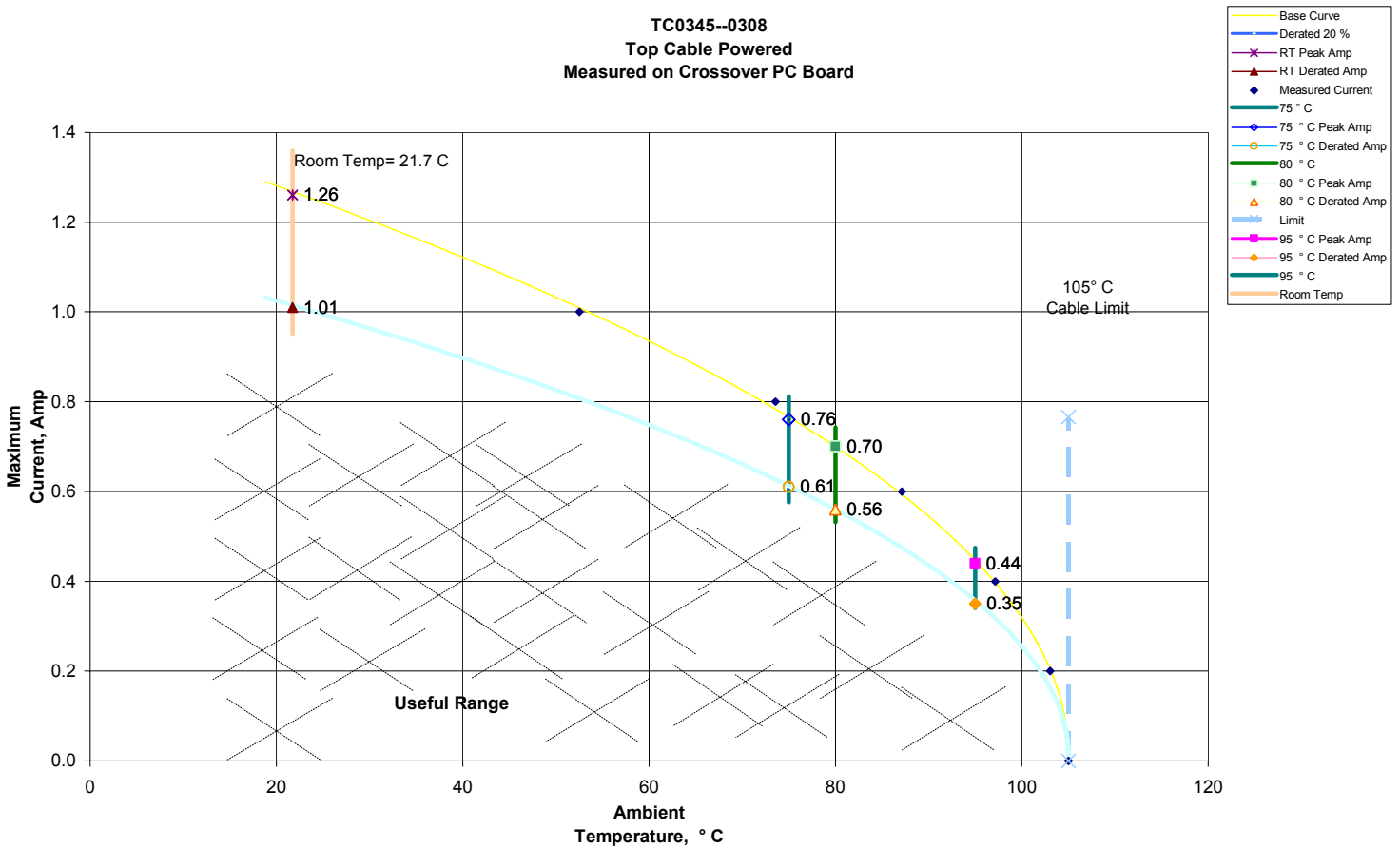
TEMPERATURE RISE (Current Carrying Capacity, CCC):

- 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).



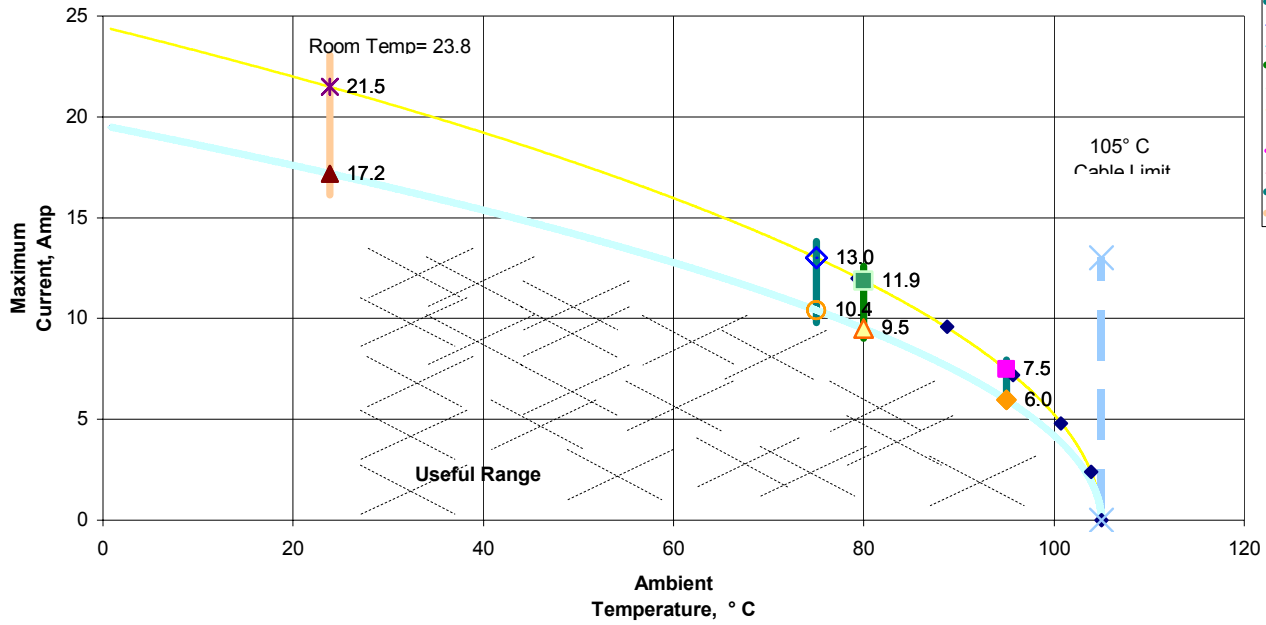
DATA SUMMARIES Continued

**TC0345-0308
Top Cable Powered
Measured on Crossover PC Board**



DATA SUMMARIES Continued

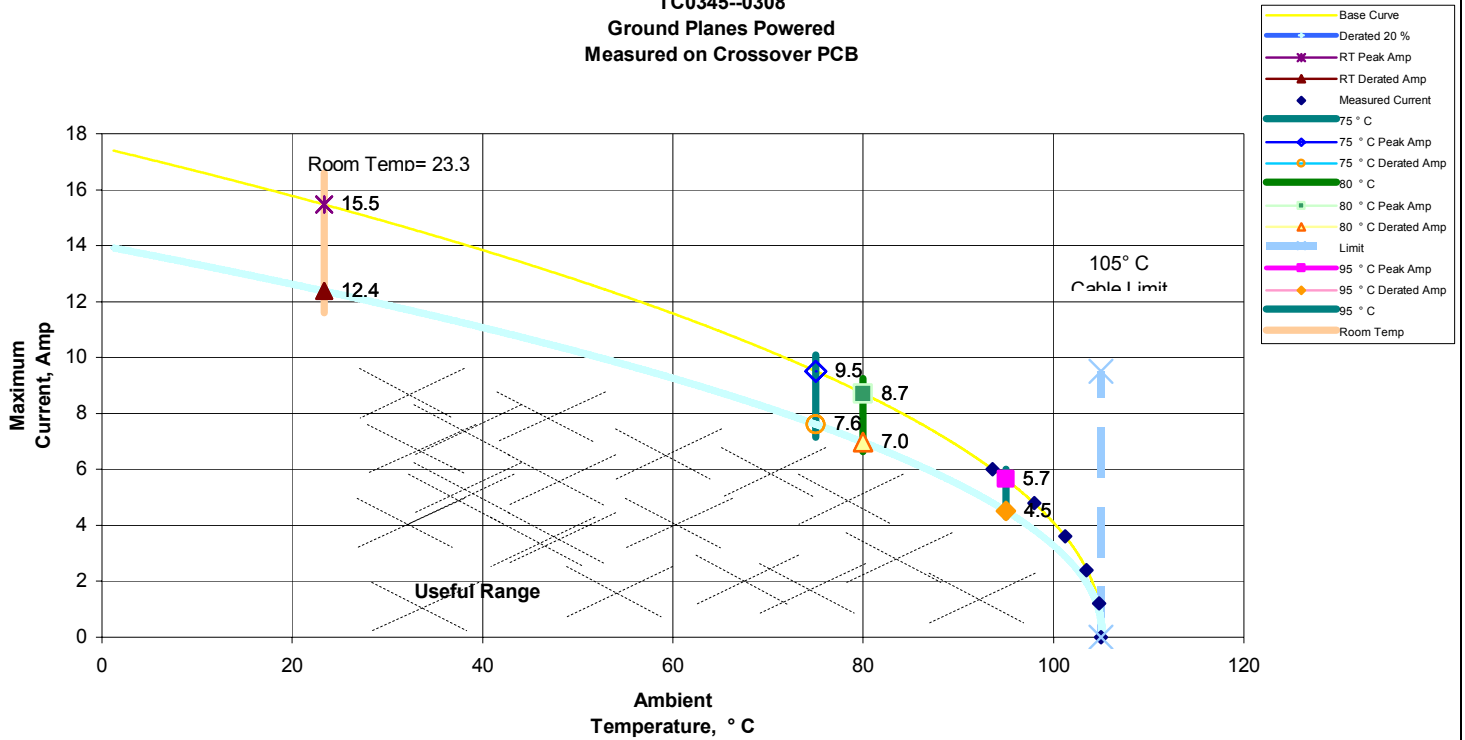
**TC0345--0308
Ground Planes Powered
Measured between cables**



- Base Curve
- Derated 20 %
- RT Peak Amp
- RT Derated Amp
- Measured Current
- 75 ° C
- 75 ° C Peak Amp
- 75 ° C Derated Amp
- 80 ° C
- 80 ° C Peak Amp
- 80 ° C Derated Amp
- Limit
- 95 ° C Peak Amp
- 95 ° C Derated Amp
- Room Temp

DATA SUMMARIES Continued

**TC0345--0308
Ground Planes Powered
Measured on Crossover PCB**



DATA SUMMARIES Continued
DIELECTRIC WITHSTANDING VOLTAGE (DWV):

<i>Voltage Rate 500 VAC Per Sec. Test until breakdown occurs</i>						
TOP						
Initial mated top, VAC			Initial unmated top, VAC			
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	850	638	213	1100	825	275
Min	850	638	213	1100	825	275
Max	850	638	213	1100	825	275
BOTTOM						
Initial mated bottom, VAC			Initial unmated bottom, VAC			
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1300	975	325	1200	900	300
Min	1300	975	325	1200	900	300
Max	1300	975	325	1200	900	300

TOP						
Thermal mated top, VAC			Thermal unmated top, VAC			
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1000	750	250	1200	900	300
Min	1000	750	250	1200	900	300
Max	1000	750	250	1200	900	300
BOTTOM						
Thermal mated bottom, VAC			Thermal unmated bottom, VAC			
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1300	975	325	1400	1050	350
Min	1300	975	325	1400	1050	350
Max	1300	975	325	1400	1050	350

TOP						
Humidity mated top, VAC			Humidity unmated top, VAC			
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	700	525	175	1000	750	250
Min	700	525	175	1000	750	250
Max	700	525	175	1000	750	250
BOTTOM						
Humidity mated bottom, VAC			Humidity unmated bottom, VAC			
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
Average	1000	750	250	1200	900	300
Min	1000	750	250	1200	900	300
Max	1000	750	250	1200	900	300

DATA SUMMARIES Continued**INSULATION RESISTANCE (IR):**

Electrification Time *Two (2)*
minutes

		Initial, Meg Ohms	
		<u>Mated top</u>	<u>Unmated top</u>
		<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average		87500	55125
Min		75000	100000
Max		100000	100000
		<u>Mated bottom</u>	<u>Unmated bottom</u>
		<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average		10000	10250
Min		5000	5500
Max		15000	15000

		Thermal, Meg Ohms	
		<u>Mated top</u>	<u>Unmated top</u>
		<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average		46250	50000
Min		35000	50000
Max		50000	50000
		<u>Mated bottom</u>	<u>Unmated bottom</u>
		<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average		42500	50000
Min		35000	50000
Max		50000	50000

		Humidity, Meg Ohms	
		<u>Mated top</u>	<u>Unmated top</u>
		<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average		68750	62500
Min		25000	50000
Max		100000	100000
		<u>Mated bottom</u>	<u>Unmated bottom</u>
		<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average		62500	50000
Min		25000	50000
Max		100000	50000

DATA SUMMARIES Continued**SUPPLEMENTAL TESTING****DWV GAS TIGHT:**

Voltage Rate 500 VAC Per Sec.						
Test Voltage Until Breakdown Occurs						
Initial, VAC			Gas Tight, Meg Ohms			
<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	
Average	1750	1313	438	1025	769	256
Min	1700	1275	425	950	713	238
Max	1800	1350	450	1100	825	275

IR GAS TIGHT:

Electrification Time Two (2) minutes		
Meg Ohms		
	Initial	Gas Tight
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
Average	10500	8000
Min	6000	1000
Max	15000	15000

DATA SUMMARIES Continued**SUPPLEMENTAL TESTS****Connector/Cable Pull, Monitored for Signal Continuity**

	0 Degrees	90 Degrees
	Force (Lbs)	Force (Lbs)
Minimum	84.28	72.29
Maximum	125.29	118.24
Average	104.46	85.74

Cable Flex 25,000 Cycles, Monitored for Signal Continuity

Resistance, Ohms/Signal Line, 35 Degree Pendulum Flexing						
	Initial	5000 Cycles	10000 Cycles	15000 Cycles	20000 Cycles	25000 Cycles
Avg	0.4034	0.4046	0.4065	0.4060	0.4316	0.4064
Min	0.3991	0.4024	0.4034	0.4031	0.4026	0.4034
Max	0.4076	0.4091	0.4099	0.4099	0.6599	0.4119
St. Dev.	0.0027	0.0021	0.0023	0.0023	0.0802	0.0024
Count	10	10	10	10	10	10

Resistance, Ohms/ Signal Line, 90 Degree Bending Mode						
	Initial	5000 Cycles	10000 Cycles	15000 Cycles	20000 Cycles	25000 Cycles
Avg	0.4043	0.4019	0.4025	#DIV/0!	#DIV/0!	#DIV/0!
Min	0.3989	0.3986	0.3994	0.0000	0.0000	0.0000
Max	0.4121	0.4079	0.4056	0.0000	0.0000	0.0000
St. Dev.	0.0042	0.0033	0.0028	#DIV/0!	#DIV/0!	#DIV/0!
Count	10	10	6	0	0	0

DATA**DIELECTRIC WITHSTANDING VOLTAGE (DWV):**

Test Date: 2/11/2004

Operator: TR

Temperature (C): 23

Humidity (RH): 23%

Voltage Rate 500 VAC Per Sec.

Test Voltage *Until Breakdown Occurs*

TOP						
<u>Sample #</u>	<u>Initial mated top, VAC</u>			<u>Initial unmated top, VAC</u>		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	850	638	213	1100	825	275
BOTTOM						
<u>Sample #</u>	<u>Initial mated bottom, VAC</u>			<u>Initial unmated bottom, VAC</u>		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	1300	975	325	1200	900	300

Test date: 1/4/2004

Operator: TR

Temperature (C): 20

Humidity (RH): 25%

Voltage Rate 500 VAC Per Sec.

Test Voltage *Until Breakdown Occurs*

TOP						
<u>Sample #</u>	<u>Thermal mated top, VAC</u>			<u>Thermal unmated top, VAC</u>		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	1000	750	250	1200	900	300
BOTTOM						
<u>Sample #</u>	<u>Thermal mated bottom, VAC</u>			<u>Thermal unmated bottom, VAC</u>		
	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	1300	975	325	1400	1050	350

DATA Continued**DIELECTRIC WITHSTANDING VOLTAGE (DWV):**

Test Date: 2/11/2004

Operator: TR

Temperature (C): 23

Humidity (RH): 23%

Voltage Rate 500 VAC Per Sec.

Test Voltage Until Breakdown Occurs

TOP

Humidity mated top, VAC

Humidity unmated top, VAC

<u>Sample #</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	700	525	175	1000	750	250

BOTTOM

Humidity mated bottom, VAC

Humidity unmated bottom, VAC

<u>Sample #</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>	<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1	1000	750	250	1200	900	300

DATA Continued**INSULATION RESISTANCE (IR):**

Test Date:	1/21/2004
Operator:	TR
Temperature (C):	23
Humidity (RH):	24%

Electrification Time *Two (2) minutes***Initial, Meg Ohms****TOP**

<u>Sample #</u>	<u>Mated</u>	<u>Unmated</u>
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	75000	100000
2	100000	100000

BOTTOM

<u>Sample #</u>	<u>Mated</u>	<u>Unmated</u>
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	5000	5500
2	15000	15000

Test Date:	2/1/2004
Operator:	TR
Temperature (C):	21
Humidity (RH):	33%

Electrification Time *Two (2) minutes***Thermal, Meg Ohms****TOP**

<u>Sample #</u>	<u>Mated</u>	<u>Unmated</u>
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	50000	50000
2	50000	50000

BOTTOM

<u>Sample #</u>	<u>Mated</u>	<u>Unmated</u>
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	50000	50000
2	35000	50000

DATA Continued**INSULATION RESISTANCE (IR):**

Test Date: 3/2/2004

Operator: Troy Cook

Temperature (C): 23

Humidity (RH): 42%

Electrification Time *Two (2) minutes*

Humidity, Meg Ohms

TOP

<u>Sample #</u>	<u>Mated</u>	<u>Unmated</u>
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	50000	50000
2	100000	100000

BOTTOM

<u>Sample #</u>	<u>Mated</u>	<u>Unmated</u>
	<u>Insulation Resistance</u>	<u>Insulation Resistance</u>
1	100000	50000
2	25000	50000

DATA Continued

SUPPLEMENTAL

DWV GAS TIGHT:

6/18/2001
TC
23
37%
STG-01
EQCD-DV-
DV

Test Date:
Operator:
Temperature (C):
Humidity (RH):
Equipment ID:

2/17/2004
Troy Cook
22
28%
STG-01
EQCD-DV-
DV

Used In:

Voltage Rate 500 VAC Per Sec.

Test Voltage Until Breakdown Occurs

Initial, VAC			Sample #	Gas Tight, VAC		
<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>		<u>Breakdown Voltage</u>	<u>DWV</u>	<u>Working Voltage</u>
1700	1275	425	1	1100	825	275
1800	1350	450	2	950	713	238

IR GAS TIGHT:

2/13/2004
TR
23
21%
STG-01
EQCD-DV-
DV

Test Date:
Operator:
Temperature (C):
Humidity (RH):
Equipment ID:

2/17/2004
Troy Cook
22
28%
STG-01
EQCD-DV-
DV

Used In:

Electrification Time Two (2) minutes

Initial, Meg Ohms	Sample #	Gas Tight, Meg Ohms
<u>Insulation Resistance</u>		<u>Insulation Resistance</u>
6000	1	1000
15000	2	15000

Tracking Code: TC0345--0308

Part #: EQCD -DV to DV, phase B DVT testing

Part description: Micro Co-ax High Speed Cable Assy, 0.8 mm Pitch

DATA Continued

SUPPLEMENTAL

Connector/Cable Pull, Monitored for Signal Continuity, 35 Degree Pendulum Mode

Test Date:	2/10/2004
Operator:	Troy Cook
Temperature (C):	21
Humidity (RH):	26%
Equipment ID:	TCT-03
Load Cell:	LC-2500N(icell)
Used In:	EQCD-DV-DV

0 Degrees		90 Degrees
Force (Lbs)	Sample#	Force (Lbs)
85.28	1	73.12
108.43	2	72.29
119.00	3	73.12
84.28	4	91.91
125.29	5	118.24

DATA Continued**SUPPLEMENTAL****Cable Flex 25,000 Cycles, Monitored for Signal Continuity, 35 Degree Pendulum Mode**

	Initial	5000 Cycles	10000 Cycles	15000 Cycles	20000 Cycles	25000 Cycles
Test Date:	1/21/2004	1/21/2004	1/21/2004	1/21/2004	1/22/2004	1/23/2004
Operator:	Troy Cook	Troy Cook	Troy Cook	Troy Cook	Troy Cook	Troy Cook
Temperature (C):	22	23	23	23	23	23
Humidity (RH):	35%	48%	48%	48%	44%	44%
Equipment ID:	MO-01	MO-01	MO-01	MO-01	MO-01	MO-01
Equipment ID:	HDR - 01	HDR - 01	HDR - 01	HDR - 01	HDR - 01	HDR - 01
Contact Part #:	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>
Cycle Rate/Hour (+/- 100):	2700	2700	2700	2700	2700	2700
Cable	Resistance, Ohms/ Signal Line, 35 Degree Pendulum Mode					
	Initial	5000 Cycles	10000 Cycles	15000 Cycles	20000 Cycles	25000 Cycles
1	0.406	0.405	0.408	0.406	0.408	0.406
2	0.408	0.404	0.410	0.409	0.410	0.408
3	0.404	0.404	0.406	0.405	0.407	0.404
4	0.405	0.407	0.408	0.408	0.660	0.407
5	0.402	0.403	0.406	0.404	0.406	0.403
6	0.399	0.402	0.403	0.403	0.403	0.406
7	0.406	0.409	0.410	0.410	0.409	0.412
8	0.402	0.404	0.405	0.405	0.405	0.407
9	0.401	0.403	0.403	0.403	0.403	0.404
10	0.403	0.406	0.406	0.406	0.405	0.407

DATA Continued**SUPPLEMENTAL****Cable Flex 25,000 Cycles, Monitored for Signal Continuity, 90 Degree Bend Mode**

	Initial	5000 Cycles	10000 Cycles	15000 Cycles	20000 Cycles	25000 Cycles
Test Date:	1/13/2004	1/13/2004	1/13/2004	1/13/2004	1/13/2004	1/13/2004
Operator:	Troy Cook	Troy Cook	Troy Cook	Troy Cook	Troy Cook	Troy Cook
Temperature (C):	23	23	23	23	23	23
Humidity (RH):	24%	48%	48%	48%	44%	44%
Equipment ID:	MO-01	MO-01	MO-01	MO-01	MO-01	MO-01
Equipment ID:	HDR - 01	HDR - 01	HDR - 01	HDR - 01	HDR - 01	HDR - 01
Contact Part #:	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>	<u>EQCD-EM</u>
Cycle Rate/Hour (+/- 100):	2700	2700	2700	2700	2700	2700
Cable	Resistance, Ohms/ Signal Line, 90 Degree Bend Mode					
	Initial	5000 Cycles	10000 Cycles	15000 Cycles	20000 Cycles	25000 Cycles
1	0.4024	0.4026	Failed @ 6639			
2	0.3989	0.3986	0.3994	Failed @ 10,004		
3	0.4016	0.4009	0.4056	Failed @ 10,004		
4	0.4001	0.3986	Failed @ 7340			
5	0.4059	0.4059	Failed @ 7340			
6	0.4036	0.3991	0.3994	Failed @ 11,683		
7	0.4026	0.3991	0.4019	Failed @ 11,673		
8	0.4121	0.4079	Failed @ 6594			
9	0.4096	0.4046	0.4049	Failed @ 11,687		
10	0.4066	0.4016	0.4041	Failed @ 11,690		

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 Cal: 6/12/03, 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-Ohmmeter**Manufacturer:** Keithley**Model:** 580**Serial #:** 00120351**Accuracy:** See Manual

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