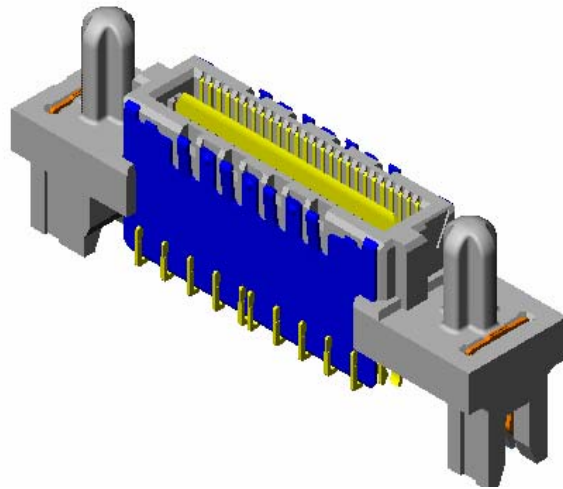




Project Number: QXSS-PC4		Tracking Code: TC049-QXSS-PC4-0378	
Requested by: Jeremy Wooldridge		Date: 2/27/2004	Product Rev: A
Part #: QMSS-026-11-L-D-A-PC4, QFSS-026-11-L-D-A-PC4		Lot #: 1	Tech: T. Receveur Eng: J.Tozier
Part description: QXSS-PC4			Qty to test: 20
Test Start:	Test Completed: 3/8/2004		



COMPLETE SEQ 1 AND 2 IN FLOWCHART TC0322--0206 Summary Report

PART DESCRIPTION

QMSS-026-11-L-D-A-PC4, QFSS-026-11-L-D-A-PC4



Project Number: QXSS-PC4		Tracking Code: TC049-QXSS-PC4-0378	
Requested by: Jeremy Wooldridge		Date: 2/27/2004	Product Rev: A
Part #: QMSS-026-11-L-D-A-PC4, QFSS-026-11-L-D-A-PC4		Lot #: 1	Tech: T. Receveur Eng: J.Tozier
Part description: QXSS-PC4			Qty to test: 20
Test Start:	Test Completed: 3/8/2004		

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: COMPLETE SEQ 1 AND 2 IN FLOWCHART TC0322--0206

APPLICABLE DOCUMENTS

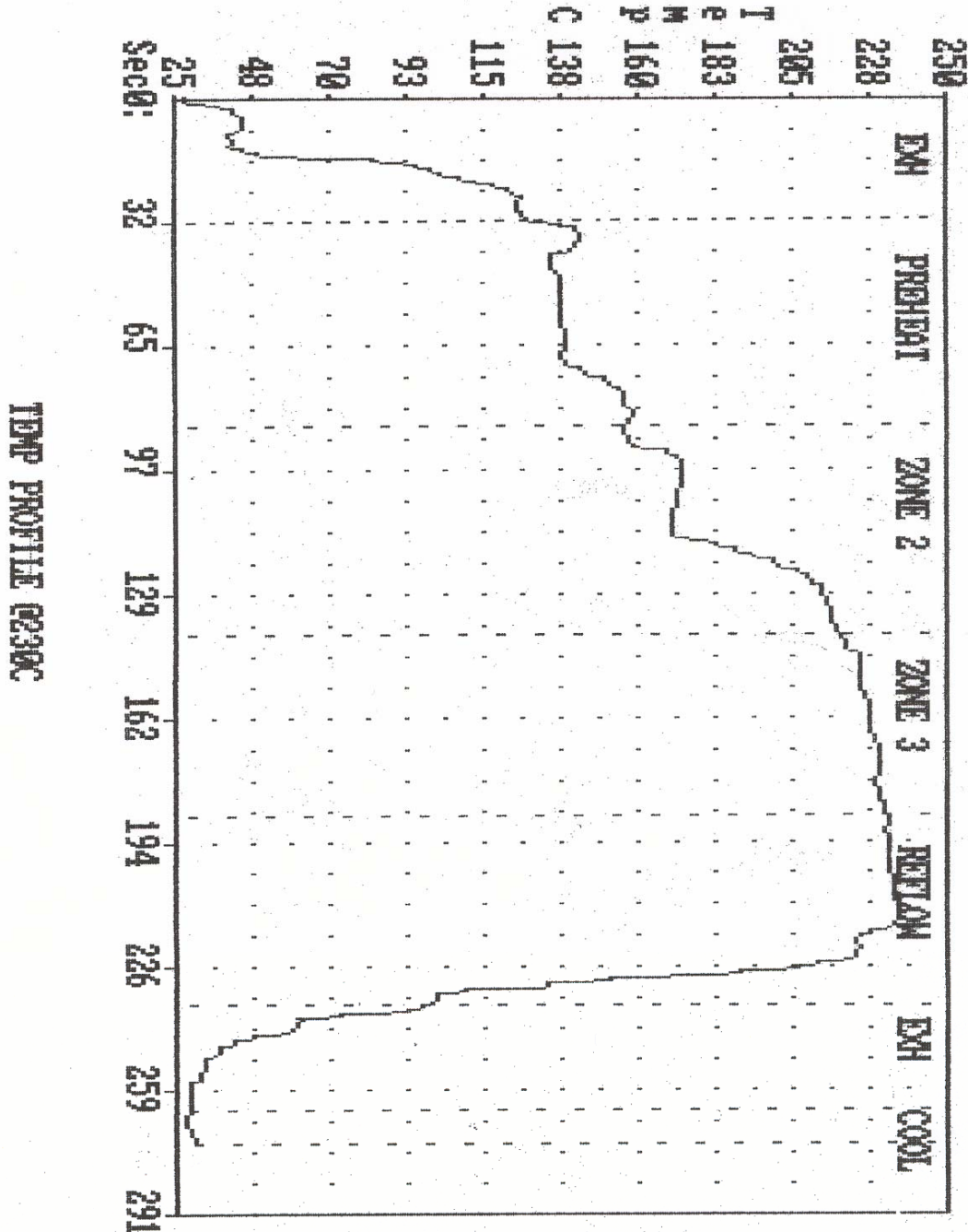
Standards: EIA Publication 364

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
 - iv) Sample test boards are removed and placed into the Branson 3510 cleaner containing deionized water with the following conditions:
 - v) Temperature:-----55° C +/- 5° C
 - vi) Frequency:-----40 KHz
 - vii) Immersion Time: -----5 to 10 Minutes
 - viii) Sample test boards are removed and placed in a beaker positioned on a hot plate with a magnetic stirrer containing deionized water warmed to 55° C +/- 5° C for 1/2 to 1 minute
 - c) Upon removal, the sample test boards are rinsed for 1/2 to 1 minute in room temperature free flowing deionized water.
 - d) After the final rinse, the sample test boards are dried in an air-circulating oven for 10 to 15 minutes at 50° C +/- 5° C
 - e) Sample test boards are then allowed to set and recover to room ambient condition prior to testing.

- 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
- 9) Solder Information:
- 10) Re-Flow Time/Temp: See accompanying profile
- 11) Internal Test PCBs used:

OVEN PROFILE (Soldering Parts to Test Boards)



Screen: Calib Data Current Job: E130-230

!!

FLOWCHARTS

TEST STEP	GROUP A 1 board min 4 POWER Contacts clustered
01	CCC

Tabulate calculated current at RT, 85° C, 95° C and 105° C

after derating 20% and based on 125 ° C

CCC, Temp rise = EIA-364-70

TEST STEP	GROUP A 10 Boards
01	Mating / Unmating
02	Data Review
03	10 Cycles
04	Mating / Unmating

Mating/Un-Mating Forces = EIA-364-13

ATTRIBUTE DEFINITION

Following is a brief, simplified description of attributes.

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) 85° C
 - c) 95° C
 - d) 105° 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.

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.

RESULTS

Temperature Rise, CCC at 20% de-rated

- At 95°C, relative to 125°C-----3.40 A with 4 adjacent contacts powered

Mating – Unmating Forces

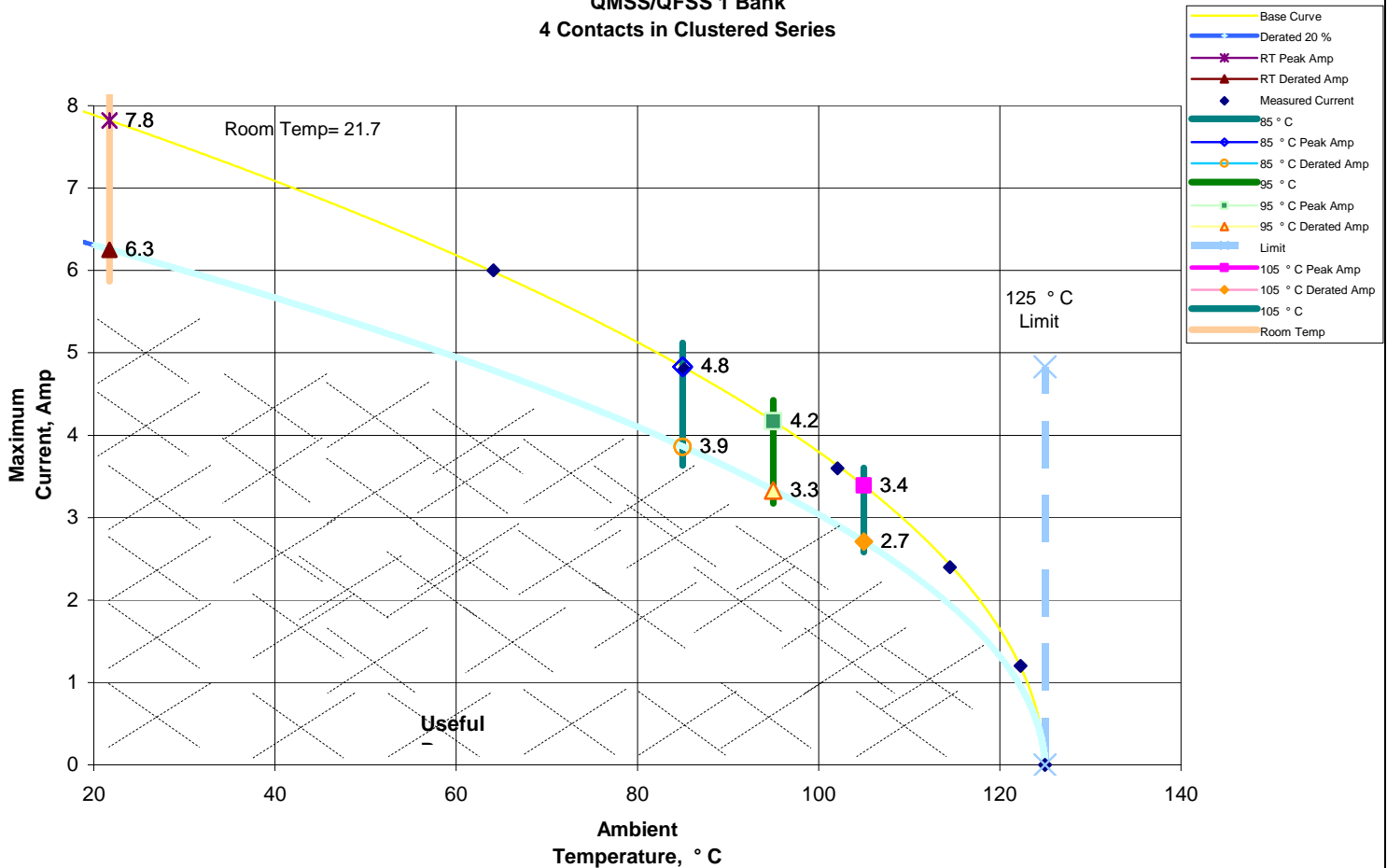
- **Initial**
 - **Mating**
 - **Min** ----- 5.80 lbs
 - **Max**----- 6.41 lbs
 - **Unmating**
 - **Min** ----- 3.86 lbs
 - **Max**----- 4.94 lbs
- **After 10 Cycles**
 - **Mating**
 - **Min** ----- 5.60 lbs
 - **Max**----- 6.51 lbs
 - **Unmating**
 - **Min** ----- 3.85 lbs
 - **Max**----- 4.84 lbs

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) Four adjacent contacts were powered:
 - a) Clustered configuration

TC049-QXSS-PC4-0378
QMSS/QFSS 1 Bank
4 Contacts in Clustered Series



DATA SUMMARIES Continued**MATING/UNMATING:**

		Initial				After 10 Cycles			
		Mating		Unmating		Mating		Unmating	
		Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
Minimum	0	92.80	5.80	61.76	3.86	89.60	5.60	61.60	3.85
Maximum	0	102.56	6.41	79.04	4.94	104.16	6.51	77.44	4.84
Average	#DIV/0!	97.74	6.11	71.84	4.49	98.22	6.14	72.66	4.54

DATA**MATING/UNMATING:**

Test Date:	3/8/2004
Operator:	TR
Temperature (C):	23
Humidity (RH):	31%
Equipment ID:	TCT-01
Load Cell ID:	DFGRS-R-ND-01
Part #	

Sample#	Board Thick	Initial				After 10 Cycles			
		Mating		Unmating		Mating		Unmating	
		Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)	Force (Oz)	Force (Lbs)
1.00	-	92.80	5.80	79.04	4.94	92.16	5.76	77.44	4.84
2.00	-	101.60	6.35	74.72	4.67	104.16	6.51	76.48	4.78
3.00	-	94.56	5.91	61.76	3.86	89.60	5.60	61.60	3.85
4.00	-	95.52	5.97	75.52	4.72	99.36	6.21	75.36	4.71
5.00	-	102.56	6.41	70.72	4.42	101.60	6.35	73.44	4.59
6.00	-	101.60	6.35	68.48	4.28	101.92	6.37	69.28	4.33
7.00	-	95.52	5.97	72.64	4.54	98.72	6.17	75.04	4.69

EQUIPMENT AND CALIBRATION SCHEDULES**Equipment #:** PS-01**Description:** System Power Supply**Manufacturer:** Hewlett Packard**Model:** HP 6033A**Serial #:** (HP) 3329A-07330**Accuracy:** See Manual 10/16/02- Had a fuse replaced and equipment was re-calibrated.

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

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 #: TC090601-109/118**Description:** IC Thermocouple-109/118**Manufacturer:** Samtec**Model:****Serial #:** TC090601-109/118**Accuracy:** +/- 1 degree C

... Last Cal: , Next Cal:

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 #: 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