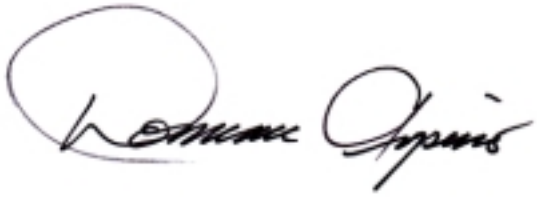
FEBRRUARY 22, 2008

TEST REPORT #207908

QSH/QTH/QTE SERIES CONNECTOR

SHEAR TESTING

SAMTEC, INC.



APPROVED BY: DOMINIC ARPINO
PROGRAM MANAGER
CONTECH RESEARCH, INC.

1478 - 01
Test Laboratory
1478 - 02

Contech Research
An Independent Test and Research Laboratory

REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
2/22/2008	1.0	Initial Issue	DA

CERTIFICATION

This is to certify that the QSH/QSE/QTH connector series evaluation described herein was designed and executed by personnel of Contech Research, Inc. It was performed with the concurrence of Samtec, Inc. of New Albany, IN who was the test sponsor.

All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to ISO 10012-1, ANSI/NCSL Z540-1 and MIL-STD-45662 as applicable.

All data, raw and summarized, analysis and conclusions presented herein are the property of the test sponsor. No copy of this report, except in full, shall be forwarded to any agency, customer, etc., without the written approval of the test sponsor and Contech Research.

Dominic Arpino
Program Manager
Contech Research, Inc.

DA:cf

SCOPE

To perform qualification testing on the QSH/QSE/QTH series connector as manufactured and submitted by the test sponsor Samtec, Inc.

APPLICABLE DOCUMENTS

Unless otherwise specified, the following documents of issue in effect at the time of testing performed form a part of this report to the extent as specified herein. The requirements of sub-tier specifications and/or standards apply only when specifically referenced in this report.

TEST SAMPLES AND PREPARATION

1. The following test samples were submitted by the test sponsor, Samtec, Inc., for the evaluation to be performed by Contech Research, Inc.

Part Numbers Tin Tails:	Sample Size
QSH-030-01-LM-D-A	5
QSE-020-01-LM-D-A	9
QTH-030-01-LM-D-A	5
QTE-020-01-LM-D-A	5
QTH-030-07-LM-D-A	9
QTE-020-07-LM-D-A	9

Part Numbers Gold Tails:	Sample Size
QSE-020-01-LG-D-A	12
QTH-030-07-LG-D-A	12
QTE-020-07-LG-D-A	12
QSH-030-01-LG-D-A	10
QTH-030-01-LG-D-A	16
QTE-020-01-LG-D-A	16

2. Test samples were supplied assembled and soldered to test boards by the test sponsor.

3. Unless otherwise specified in the test procedures used, no further preparation was used.

TEST SELECTION

Test set ups and/or procedures which are standard or common are not detailed or documented herein provided they are certified as being performed in accordance with the applicable (industry or military) test methods, standards and/or drawings as specified in the detail specification.

SAMPLE CODING

1. All samples were coded. Coding was performed in a manner which remained legible for the test duration.

2. The test samples were coded in the following manner:

Part Numbers Tin Tails:	File Number
PCB-100767-TST-01B/QSE-020-01-LM-D-A	01
PCB-100767-TST-01A/QSH-030-01-LM-D-A	03
PCB-100767-TST-02A/QTH-030-01-LM-D-A	04
PCB-100767-TST-02B/QTE-020-01-LM-D-A	05
PCB-100767-TST-01C/QTH-030-07-LM-D-A	06
PCB-100767-TST-02C/QTE-020-07-LG-D-A	07

Part Numbers Gold Tails:	File Number
PCB-100767-TST-01B/QSE-020-01-LG-D-A	02
PCB-100767-TST-01C/QTH-030-07-LG-D-A	08
PCB-100767-TST-02C/QTE-020-07-LG-D-A	09
PCB-100767-TST-01A/QSH-030-01-LG-D-A	10
PCB-100767-TST-02A/QTH-030-01-LG-D-A	11
PCB-100767-TST-02B/QTE-020-01-LG-D-A	12

DATA SUMMARY

TEST- Shear Test **RESULTS**

Scale - LBS.

Part Numbers Tin Tails:	AVG.	MIN.	MAX.
QSE-020-01-LM-D-A	113.3	101.5	126.0
QSH-030-01-LM-D-A	110.2	99.5	114.0
QTH-030-01-LM-D-A	156.7	120.0	214.0
QTE-020-01-LM-D-A	157.8	128.0	179.0
QTH-030-07-LM-D-A	94.9	73.0	104.0
QTE-020-07-LM-D-A	107.9	91.0	122.5

Part Numbers Gold Tails:	AVG.	MIN.	MAX.
QSE-020-01-LG-D-A	110.5	95.0	140.0
QTH-030-07-LG-D-A	80.3	60.5	100.0
QTE-020-07-LG-D-A	109.4	96.5	119.0
QSH-030-01-LG-D-A	99.0	71.5	110.5
QTH-030-01-LG-D-A	133.4	95.0	186.5
QTE-020-01-LG-D-A	146.1	76.0	199.0

Observation:

No significant difference between the Tin Tail samples and the Gold Tail samples.

EQUIPMENT LIST

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq.Cal
38	2/13/2009	2/13/2008	Universal Test Stand	Chatillon	UTSM-SS	1030	±.05 in.	12 mon.
323			Computer	Legatech	286-12	N/A	N/A	N/A
398	5/15/2008	5/15/2007	500 Pound Force Gage	Chatillon	DFI-500	11792	±1.25 LBS	12 mon

PROJECT NO.: 207908 SPECIFICATION: N/A

PART NO.: see page 5 PART DESCRIPTION: QSeries

SAMPLE SIZE: se page 5 TECHNICIAN: DAM

START DATE: 2-4-08 COMPLETE DATE: 2-7-08

ROOM AMBIENT: 22°C RELATIVE HUMIDITY: 24%

EQUIPMENT ID#: 38, 323, 398

SHEAR TEST

PURPOSE:

To determine if there is any adhesive difference between the Tin Tail samples vs. Gold Tail samples.

PROCEDURE:

1. Test Conditions: Shear rates 1-inch per minute.

2. A stabilizing medium was placed behind the PCB so that the board would remain rigid during the test.

3. Figure #1 through #5 illustrates the test sample fixturing utilized during the test.

REQUIREMENTS:

Record the value that the connector and or the connector and the tail pins shear off the PCB.

RESULTS:

See data files 20790801 through 20790812 for individual data points.

FIGURE #1

FIGURE #2

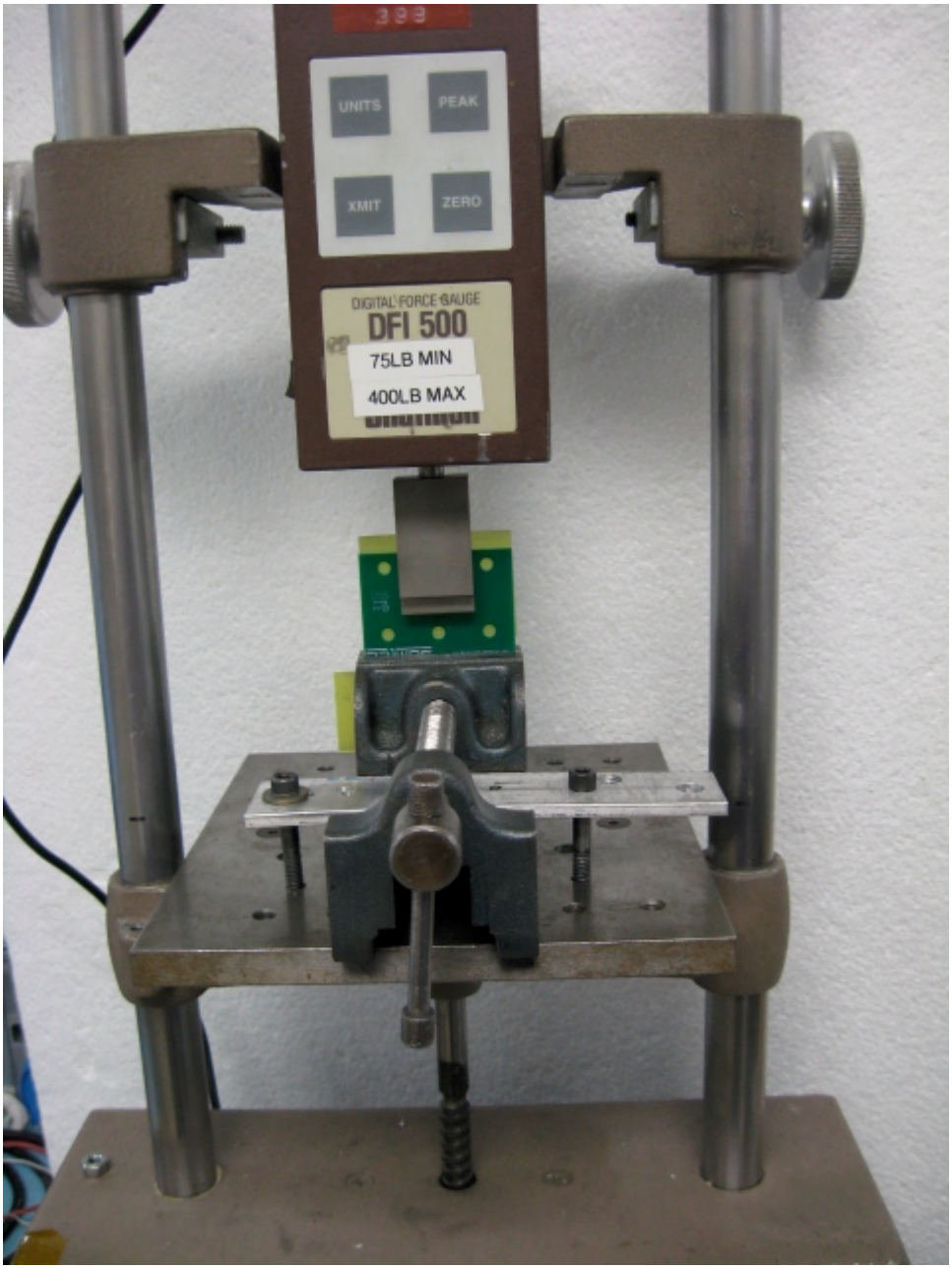

UNITS
PEAK
XMIT
ZERO
DIGITAL FORCE GAUGE
DFI 500
75LB MIN
400LB MAX

FIGURE #3

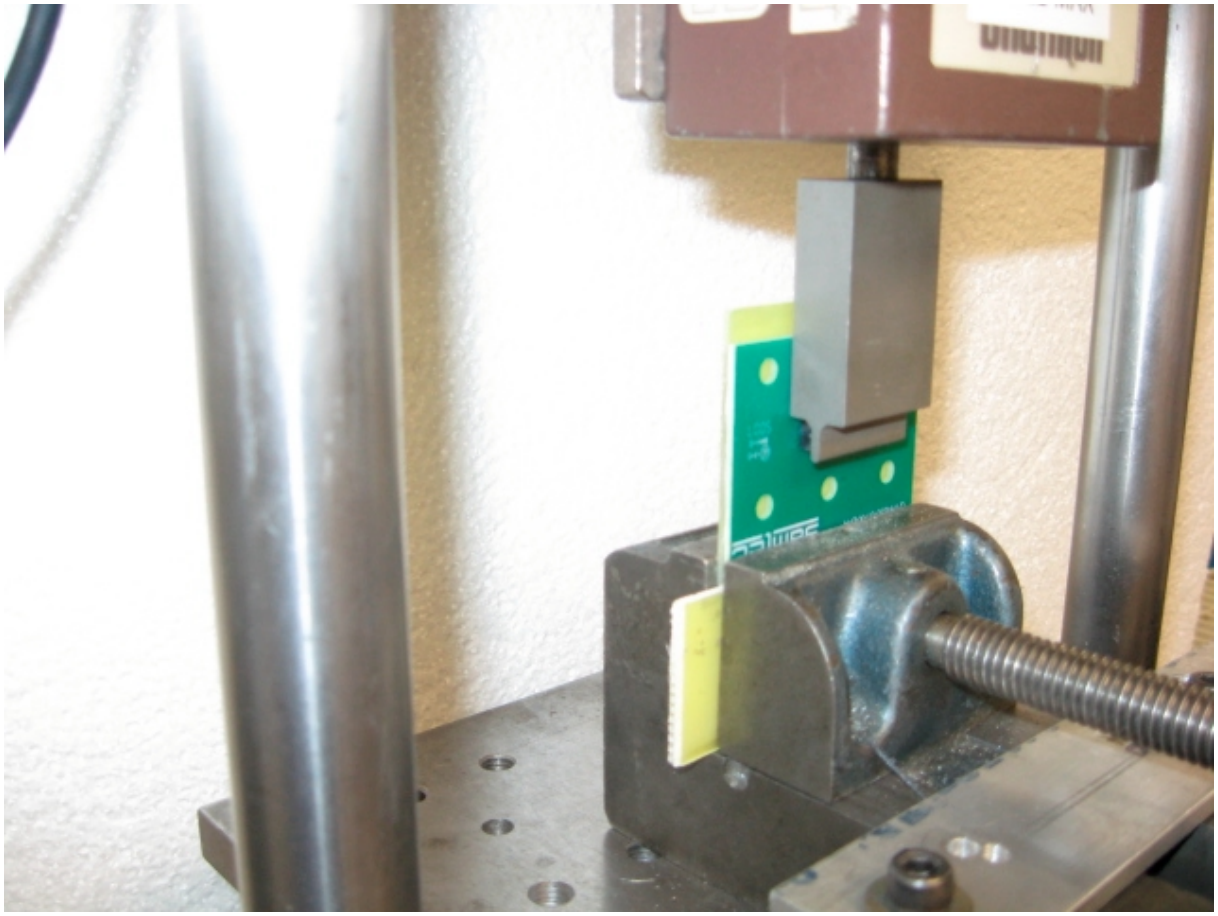


FIGURE #4

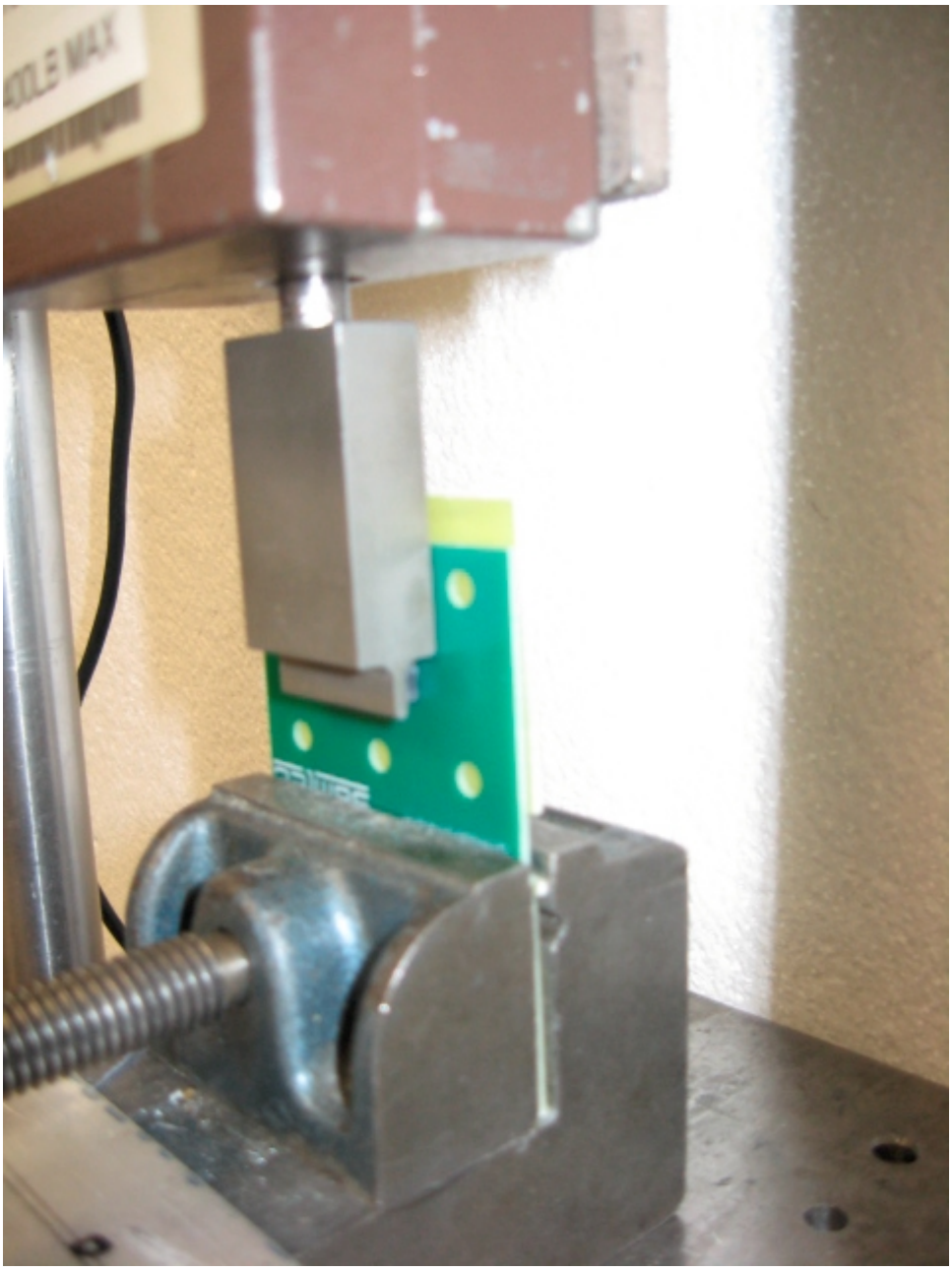
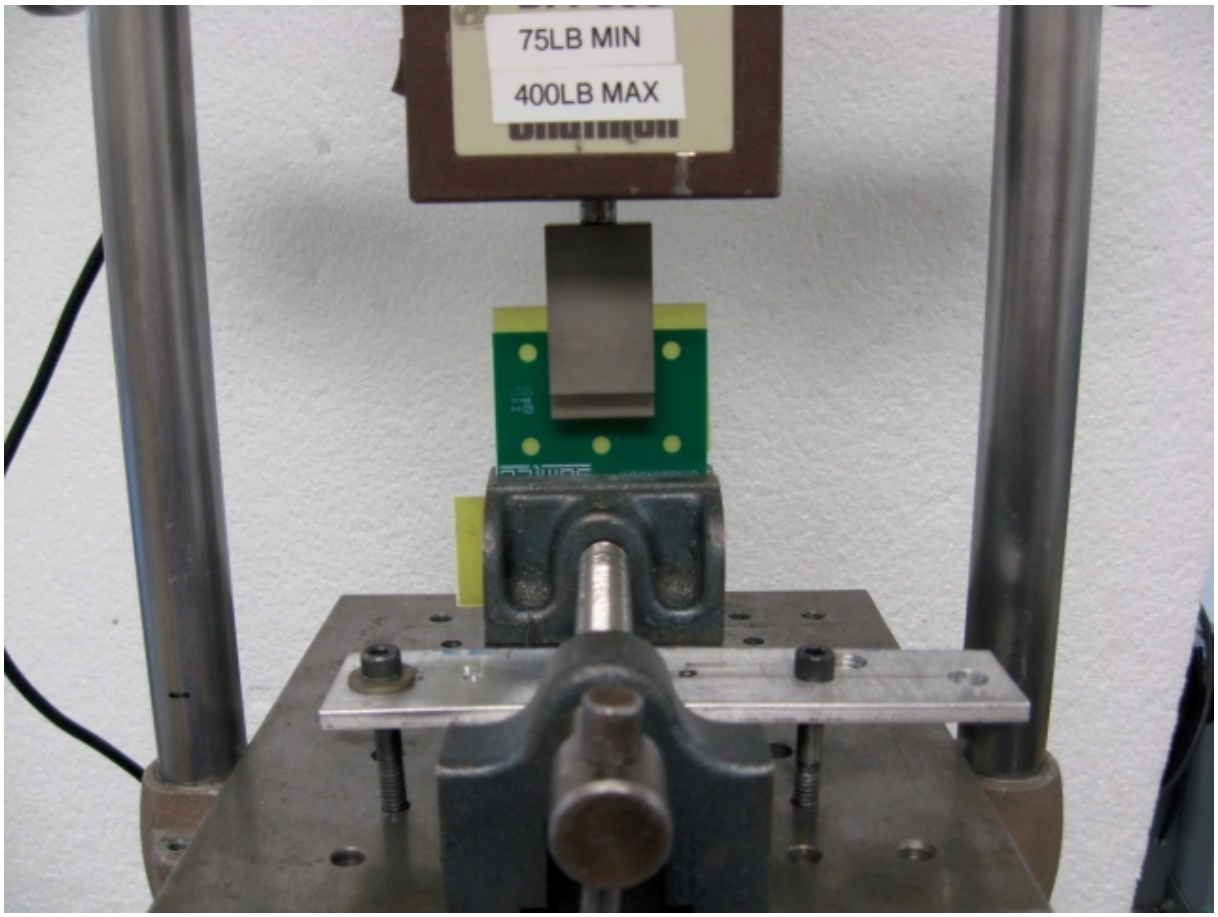


FIGURE #5



DATA FILES

Group: TIN TAILS

DATA FILE NUMBERS

20790801
20790803
20790804
20790805
20790806
20790807

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: (Tin Plate)	
Product:PCB-100767-TST-01B /QSE-020-01-LM-D-A				File #: 20790801	
Description: 9 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	22				
Date:	04Feb08				
Conn#					
1	113.3	Conn still attached to board			
2	116.0	Conn Sheared off from PCB			
3	126.0	Conn Sheared off from PCB			
4	101.5	Conn Sheared off from PCB			
5	112.5	Conn still attached to board			
6	119.5	Conn Sheared off from PCB			
7	101.5	Conn still attached to board			
8	115.0	Conn Sheared off from PCB			
9	114.5	Conn Sheared off from PCB			
MAX	126.0				
MIN	101.5				
AVG	113.3				
Open	0				
Tech	DAM				
Equip ID	323				
	297				

		Shear testing			
Project: 207908				N/A	
Customer: Samtec				Subgroup: (Tin plate)	
Product:PCB-100767-TST-01A /QSH-030-01-LM-D-A				File #: 20790803	
Description: 5 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	24				
Date:	05Feb08				
Conn#					
1	114.0	Conn sheared off from PCB			
2	114.0	Conn sheared off from PCB			
3	113.0	Conn sheared off from PCB			
4	110.5	Conn sheared off from PCB			
5	99.5	Conn sheared off from PCB			
MAX	114.0				
MIN	99.5				
AVG	110.2				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: (Tin plate)	
Product:PCB-100767-TST-02A /QTH-030-01-LM-D-A				File #: 20790804	
Description: 5 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	24				
Date:	05Feb08				
Conn#					
1	201.0	Conn & Pins Sheared off from PCB			
2	123.0	Conn & Pins Sheared off from PCB			
3	120.0	Conn & Pins Sheared off from PCB			
4	125.5	Conn & Pins Sheared off from PCB			
5	214.0	Conn & Pins Sheared off from PCB			
MAX	214.0				
MIN	120.0				
AVG	156.7				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: (Tin plate)	
Product:PCB-100767-TST-02B /QTE-020-01-LM-D-A				File #: 20790805	
Description: 5 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	24				
Date:	05Feb08				
Conn#					
1	179.0	Conn & Pins Sheared from PCB			
2	132.0	Conn & Pins Sheared from PCB			
3	171.0	Conn & Pins Sheared from PCB			
4	128.0	Conn & Pins Sheared from PCB			
5	179.0	Conn & Pins Sheared from PCB			
MAX	179.0				
MIN	128.0				
AVG	157.8				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: (Tin plate)	
Product:PCB-100767-TST-01C /QTH-030-07-LM-D-A				File #: 20790806	
Description: 9 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	24				
Date:	05Feb08				
Conn#					
1	100.0	Conn & Pins Sheared off from PCB			
2	96.0	Conn & Pins Sheared off from PCB			
3	91.0	Conn & Pins Sheared off from PCB			
4	96.0	Conn & Pins Sheared off from PCB			
5	104.0	Conn & Pins Sheared off from PCB			
6	102.5	Conn & Pins Sheared off from PCB			
7	97.5	Conn & Pins Sheared off from PCB			
8	94.0	Conn & Pins Sheared off from PCB			
9	73.0	Conn & Pins Sheared off from PCB			
MAX	104.0				
MIN	73.0				
AVG	94.9				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: (Tin plate)	
Product:PCB-100767-TST-02C /QTE-020-07-LM-D-A)				File #: 20790807	
Description: 9 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	24				
Date:	05Feb08				
Conn#					
1	112.0	Conn & Pins Sheared off from PCB			
2	91.0	Conn & Pins Sheared off from PCB			
3	106.0	Conn & Pins Sheared off from PCB			
4	104.5	Conn & Pins Sheared off from PCB			
5	122.5	Conn & Pins Sheared off from PCB			
6	100.5	Conn & Pins Sheared off from PCB			
7	118.0	Conn & Pins Sheared off from PCB			
8	107.0	Conn & Pins Sheared off from PCB			
9	109.5	Conn & Pins Sheared off from PCB			
MAX	122.5				
MIN	91.0				
AVG	107.9				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

DATA FILES

Group: Gold TAILS

DATA FILE NUMBERS

20790802
20790808
20790809
207908010
207908011
207908012

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup:Gold plate	
Product:PCB-100767-TST-01B /QSE-020-01-LG-D-A				File #: 20790802	
Description: 12 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	22				
Date:	04Feb08				
Conn#					
1	96.5	Conn Sheared off from PCB			
2	112.0	Conn Sheared off from PCB			
3	111.0	Conn Sheared off from PCB			
4	103.0	Conn Sheared off from PCB			
5	112.5	Conn Sheared off from PCB			
6	111.0	Conn Sheared off from PCB			
7	140.0	Conn still attached to board			
8	95.0	Conn Sheared off from PCB			
9	107.0	Conn Sheared off from PCB			
10	115.0	Conn Sheared off from PCB			
11	115.0	Conn still attached to board			
12	108.5	Conn Sheared off from PCB			
MAX	140.0				
MIN	95.0				
AVG	110.5				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: Gold plate	
Product:PCB-100767-TST-01C /QTH-030-07-LG-D-A				File #: 20790808	
Description: 12 Samples					
			Actual values		
			units:LBS		
Temp ºC	23				
R.H. %	24				
Date:	05Feb08				
Conn#					
1	74.0	Conn & Pins Sheared off from PCB			
2	77.5	Conn & Pins Sheared off from PCB			
3	96.5	Conn & Pins Sheared off from PCB			
4	100.0	Conn & Pins Sheared off from PCB			
5	72.0	Conn & Pins Sheared off from PCB			
6	60.5	Conn & Pins Sheared off from PCB			
7	70.5	Conn & Pins Sheared off from PCB			
8	77.0	Conn & Pins Sheared off from PCB			
9	84.5	Conn & Pins Sheared off from PCB			
10	81.5	Conn & Pins Sheared off from PCB			
11	91.0	Conn & Pins Sheared off from PCB			
12	78.0	Conn & Pins Sheared off from PCB			
MAX	100.0				
MIN	60.5				
AVG	80.3				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: Gold plate	
Product:PCB-100767-TST-02C /QTE-020-07-LG-D-A				File #: 20790809	
Description: 12 Samples					
			Actual values		
			units:LBS		
Temp ºC	22				
R.H. %	28				
Date:	06Feb08				
Conn#					
1	108.0	Conn & Pins Sheared off from PCB			
2	106.5	Conn & Pins Sheared off from PCB			
3	109.0	Conn & Pins Sheared off from PCB			
4	96.5	Conn & Pins Sheared off from PCB			
5	96.5	Conn & Pins Sheared off from PCB			
6	105.5	Conn & Pins Sheared off from PCB			
7	107.0	Conn & Pins Sheared off from PCB			
8	118.0	Conn & Pins Sheared off from PCB			
9	119.0	Conn & Pins Sheared off from PCB			
10	114.0	Conn & Pins Sheared off from PCB			
11	117.5	Conn & Pins Sheared off from PCB			
12	115.0	Conn & Pins Sheared off from PCB			
MAX	119.0				
MIN	96.5				
AVG	109.4				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: Gold plate	
Product:PCB-100767-TST-01A /QSH-030-01-LG-D-A				File #: 20790810	
Description: 10 Samples					
			Actual values		
			units:LBS		
Temp ºC	22				
R.H. %	28				
Date:	06Feb08				
Conn#					
1	71.5	Conn sheared off from PCB			
2	101.0	Conn sheared off from PCB			
3	105.5	Conn sheared off from PCB			
4	107.5	Conn sheared off from PCB			
5	90.5	Conn sheared off from PCB			
6	105.5	Conn sheared off from PCB			
7	95.5	Conn sheared off from PCB			
8	103.5	Conn sheared off from PCB			
9	110.5	Conn sheared off from PCB			
10	99.0	Conn sheared off from PCB			
MAX	110.5				
MIN	71.5				
AVG	99.0				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec: N/A	
Customer: Samtec				Subgroup: Gold plate	
Product:PCB-100767-TST-02A /QTH-030-01-LG-D-A				File #: 20790811	
Description: 16 Samples					
			Actual values		
			units:LBS		
Temp ºC	22				
R.H. %	28				
Date:	07Feb08				
Conn#					
1	182.5	Conn & Pins Sheared off from PCB			
2	170.5	Conn & Pins Sheared off from PCB			
3	111.0	Conn & Pins Sheared off from PCB			
4	112.5	Conn & Pins Sheared off from PCB			
5	186.5	Conn & Pins Sheared off from PCB			
6	160.5	Conn & Pins Sheared off from PCB			
7	120.0	Conn & Pins Sheared off from PCB			
8	137.5	Conn & Pins Sheared off from PCB			
9	109.0	Conn & Pins Sheared off from PCB			
10	157.0	Conn & Pins Sheared off from PCB			
11	146.0	Conn & Pins Sheared off from PCB			
12	95.0	Conn & Pins Sheared off from PCB			
13	121.5	Conn & Pins Sheared off from PCB			
14	107.5	Conn & Pins Sheared off from PCB			
15	102.0	Conn & Pins Sheared off from PCB			
16	116.0	Conn & Pins Sheared off from PCB			
MAX	186.5				
MIN	95.0				
AVG	133.4				
Open	0				
Tech	DAM				
Equip ID	398				
	38				

		Shear testing			
Project: 207908				Spec:	
Customer: Samtec				Subgroup: Gold plate	
Product:PCB-100767-TST-02B /QTE-020-01-LG-D-A				File #: 20790812	
Description: 16 Samples					
			Actual values		
			units:LBS		
Temp ºC	22				
R.H. %	28				
Date:	07Feb08				
Conn#					
1	133.5	Conn & Pins Sheared off from PCD			
2	170.0	Conn & Pins Sheared off from PCD			
3	116.0	Conn & Pins Sheared off from PCD			
4	76.0	Conn & Pins Sheared off from PCD			
5	156.0	Conn & Pins Sheared off from PCD			
6	178.5	Conn & Pins Sheared off from PCD			
7	162.0	Conn & Pins Sheared off from PCD			
8	153.5	Conn still attached to board			
9	118.0	Conn & Pins Sheared off from PCD			
10	146.0	Conn & Pins Sheared off from PCD			
11	160.5	Conn & Pins Sheared off from PCD			
12	114.0	Conn & Pins Sheared off from PCD			
13	199.0	Conn & Pins Sheared off from PCD			
14	163.0	Conn & Pins Sheared off from PCD			
15	183.0	Conn & Pins Sheared off from PCD			
16	108.0	Conn & Pins Sheared off from PCD			
MAX	199.0				
MIN	76.0				
AVG	146.1				
Open	0				
Tech	DAM				
Equip ID	398				
	38				