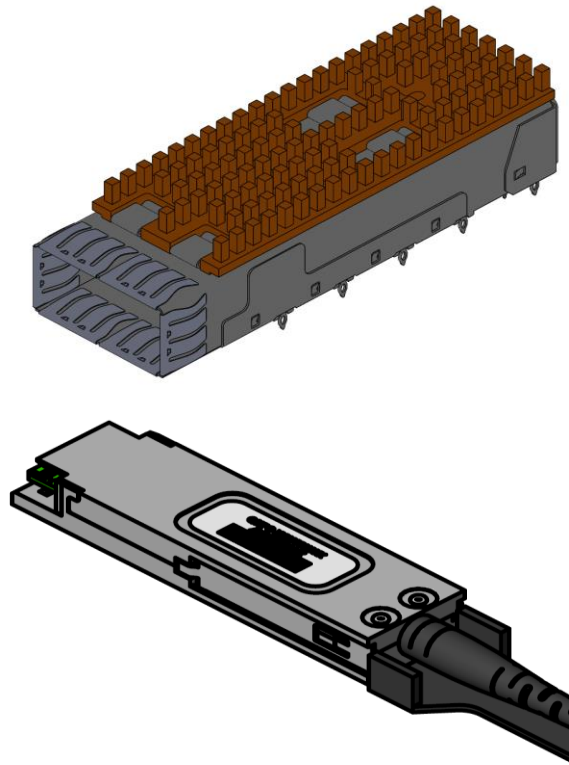




Project Number: Design Qualification Test Report	Tracking Code: 1299240_Report_Rev_2
Requested by: Hardy Tain	Date: 4/3/2018
Part #: QSFPC-1-1-S-F/QSFPO-XXX-XXX-01-XX-X	Tech: Peter Chen
Part description: QFSPC/QSFPO	Qty to test: 14
Test Start: 10/13/2017	Test Completed: 11/01/2017



DESIGN QUALIFICATION TEST REPORT

QFSPC/QSFPO

QSFPC-1-1-S-F/QSFPO-XXX-XXX-01-XX-X

Tracking Code:1299240_Report_Rev_2	Part #: QSFPC-1-1-S-F/QSFPO-XXX-XXX-01-XX-X
Part description: QFSPC/QSFPO	

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
11/06/2017	1	Initial Issue	PC
4/3/2018	2	Updated the parts number	PC

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: Design Qualification test. Please see test plan.

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) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
- 4) The automated procedure is used with aqueous compatible soldering materials.
- 5) Any additional preparation will be noted in the individual test sequences.
- 6) Solder Information: Lead free
- 7) Samtec Test PCBs used: PCB-108580-TST/ PCB-108581-TST.

FLOWCHARTS

Mating/Unmating/Durability

Note: Use the Same QSFPO-XXX-XXX-01-XX-X for each group.

Group 1

QSFPC-1-1-S-F

QSFPO-XXX-XXX-01-XX-X

8 Assemblies

Note: Cage with EMI fingers without latches and connector.

Step	Description
------	-------------

1.	Contact Gaps
----	--------------

Note: No contact gaps. Measure the clearance allowed by the EMI fingers, height and width.

2.	Mating/Unmating Force ⁽¹⁾
----	--------------------------------------

Note: Forces to be measured on the Initial Cycle.

(1) Mating/Unmating Force = EIA-364-13

Compliant Pin Buckling

Group 1

QSFPC-1-1-S-F

QSFPO-XXX-XXX-01-XX-X

20

HASL .039" PTH 20 Assemblies

Step	Description
------	-------------

1.	Contact Gaps
----	--------------

2.	Measure PTH Diameter
----	----------------------

3.	Presses Connectors
----	--------------------

4.	Visual Connector Inspection
----	-----------------------------

5.	Cross Section Connectors
----	--------------------------

Group 2

QSFPC-1-1-S-F

QSFPO-XXX-XXX-01-XX-X

20

HASL .043" PTH 20 Assemblies

Step	Description
------	-------------

1.	Contact Gaps
----	--------------

2.	Measure PTH Diameter
----	----------------------

3.	Presses Connectors
----	--------------------

4.	Visual Connector Inspection
----	-----------------------------

5.	Cross Section Connectors
----	--------------------------

FLOWCHARTS Continued**Insertion/Retention /Hole Conditioning**

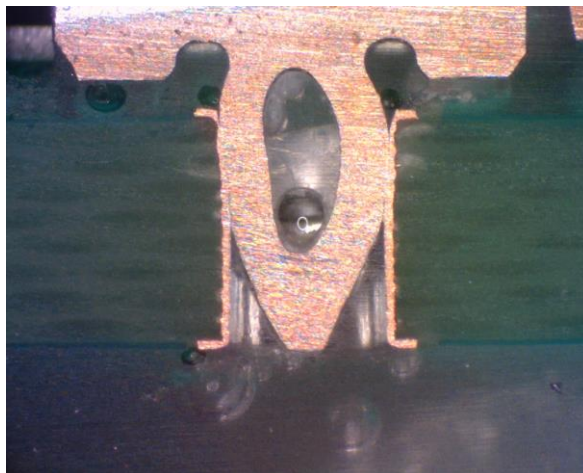
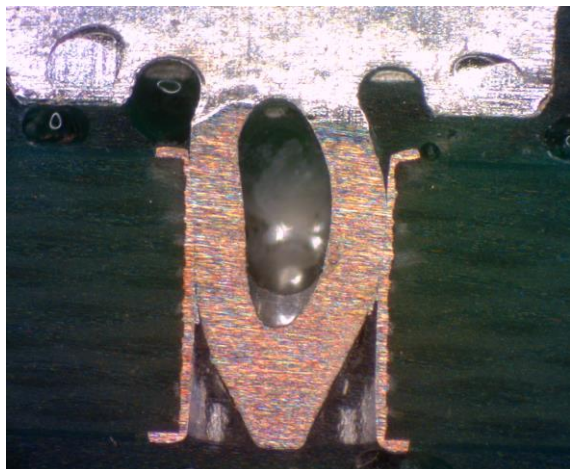
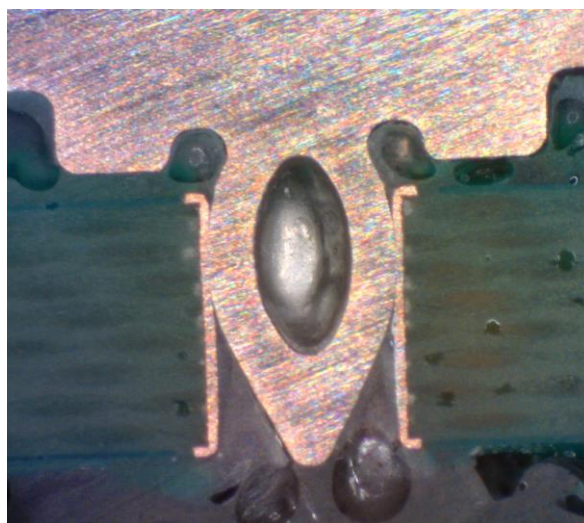
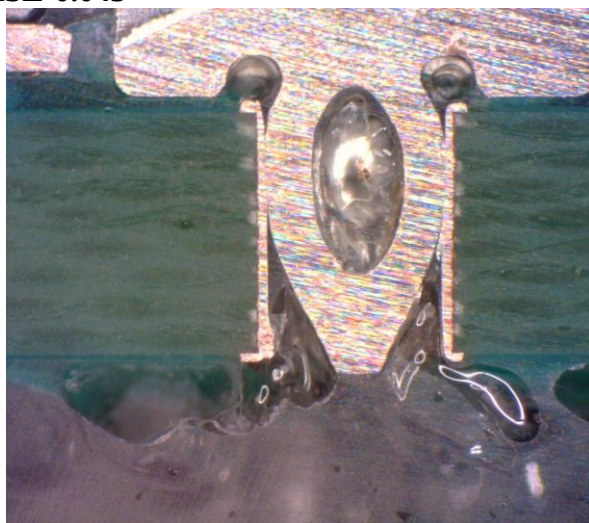
Group 1 QSFPC-1-1-S-F QSFPO-XXX-XXX-01-XX-X 30 HASL .039" PTH (Cage)		Group 2 QSFPC-1-1-S-F QSFPO-XXX-XXX-01-XX-X 30 HASL .043" PTH (Cage)		Group 3 QSFPC-1-1-S-F QSFPO-XXX-XXX-01-XX-X 30 ENIG .039" PTH (Cage)		Group 4 QSFPC-1-1-S-F QSFPO-XXX-XXX-01-XX-X 30 ENIG .043" PTH (Cage)	
Step	Description	Step	Description	Step	Description	Step	Description
1.	Insertion Force Rate = 2.54 mm/min Note: Pin 1	1.	Insertion Force Rate = 2.54 mm/min Note: Pin 1	1.	Insertion Force Rate = 2.54 mm/min Note: Pin 1	1.	Insertion Force Rate = 2.54 mm/min Note: Pin 1
2.	Retention Force Rate = 2.54 mm/min Note: Pin 1 Note: EIA-364-29	2.	Retention Force Rate = 2.54 mm/min Note: Pin 1 Note: EIA-364-29	2.	Retention Force Rate = 2.54 mm/min Note: Pin 1 Note: EIA-364-29	2.	Retention Force Rate = 2.54 mm/min Note: Pin 1 Note: EIA-364-29
3.	Cycles Quantity = 1 Cycles Note: Pin 2	3.	Cycles Quantity = 1 Cycles Note: Pin 2	3.	Cycles Quantity = 1 Cycles Note: Pin 2	3.	Cycles Quantity = 1 Cycles Note: Pin 2
4.	Insertion Force Rate = 2.54 mm/min Note: Pin 3	4.	Insertion Force Rate = 2.54 mm/min Note: Pin 3	4.	Insertion Force Rate = 2.54 mm/min Note: Pin 3	4.	Insertion Force Rate = 2.54 mm/min Note: Pin 3
5.	Retention Force Rate = 2.54 mm/min Note: Pin 3 Note: EIA-364-29	5.	Retention Force Rate = 2.54 mm/min Note: Pin 3 Note: EIA-364-29	5.	Retention Force Rate = 2.54 mm/min Note: Pin 3 Note: EIA-364-29	5.	Retention Force Rate = 2.54 mm/min Note: Pin 3 Note: EIA-364-29
6.	Hole Integrity Note: Check for distortion of the PTH according to EIA-364-96	6.	Hole Integrity Note: Check for distortion of the PTH according to EIA-364-96	6.	Hole Integrity Note: Check for distortion of the PTH according to EIA-364-96	6.	Hole Integrity Note: Check for distortion of the PTH according to EIA-364-96

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

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.

Compliant Pin Bucking Picture**HASL-0.039"****HASL-0.043"**

RESULTS

Mating & Unmating force

- Initial
 - Mating
 - Min ----- 2.71 Lbs
 - Max ----- 4.71 Lbs
 - Unmating
 - Min ----- 2.76 Lbs
 - Max ----- 3.79 Lbs

Compliant pin Insertion/Withdrawal Forces

HASL-0.039"

- Initial
 - Mating
 - Min ----- 9.55 Lbs
 - Max ----- 13.40 Lbs
 - Unmating
 - Min ----- 2.46 Lbs
 - Max ----- 4.01 Lbs
- After 3 Cycles
 - Mating
 - Min ----- 7.53 Lbs
 - Max ----- 9.25 Lbs
 - Unmating
 - Min ----- 1.49 Lbs
 - Max ----- 2.98 Lbs

HASL-0.043"

- Initial
 - Mating
 - Min ----- 5.10 Lbs
 - Max ----- 7.33 Lbs
 - Unmating
 - Min ----- 1.55 Lbs
 - Max ----- 3.08 Lbs
- After 3 Cycles
 - Mating
 - Min ----- 3.98 Lbs
 - Max ----- 6.52 Lbs
 - Unmating
 - Min ----- 1.14 Lbs
 - Max ----- 2.62 Lbs

RESULTS Continue**ENIG-0.039"**

- **Initial**
 - **Mating**
 - **Min** ----- 7.33 Lbs
 - **Max** ----- 11.97 Lbs
 - **Unmating**
 - **Min** ----- 1.07 Lbs
 - **Max** ----- 2.43 Lbs
- **After 3 Cycles**
 - **Mating**
 - **Min** ----- 6.83 Lbs
 - **Max** ----- 8.69 Lbs
 - **Unmating**
 - **Min** ----- 0.80 Lbs
 - **Max** ----- 2.00 Lbs

ENIG-0.043"

- **Initial**
 - **Mating**
 - **Min** ----- 4.03 Lbs
 - **Max** ----- 6.15 Lbs
 - **Unmating**
 - **Min** ----- 1.54 Lbs
 - **Max** ----- 2.56 Lbs
- **After 3 Cycles**
 - **Mating**
 - **Min** ----- 3.64 Lbs
 - **Max** ----- 5.17 Lbs
 - **Unmating**
 - **Min** ----- 1.32 Lbs
 - **Max** ----- 2.16 Lbs

DATA SUMMARIES**Mating & Unmating force**

	Initial			
	Mating		Unmating	
	New tons	Force (Lbs)	New tons	Force (Lbs)
Minimum	12.05	2.71	12.28	2.76
Maximum	20.95	4.71	16.86	3.79
Average	14.92	3.36	14.14	3.18
St Dev	2.89	0.65	1.53	0.34
Count	8	8	8	8

Compliant Pin Insertion/Retention force:
HASL 0.039" PTH (Cage)

Cycle 1		Cycle 3	
Insertion Force Summary		Insertion Force Summary	
Minimum	9.55	Minimum	7.53
Maximum	13.40	Maximum	9.25
Average	11.17	Average	8.37
St. Dev.	0.90	St. Dev.	0.42
Cycle 1		Cycle 3	
Retention Force Summary		Retention Force Summary	
Minimum	2.46	Minimum	1.49
Maximum	4.01	Maximum	2.98
Average	3.31	Average	2.07
St. Dev.	0.33	St. Dev.	0.30

HASL 0.043" PTH (Cage)

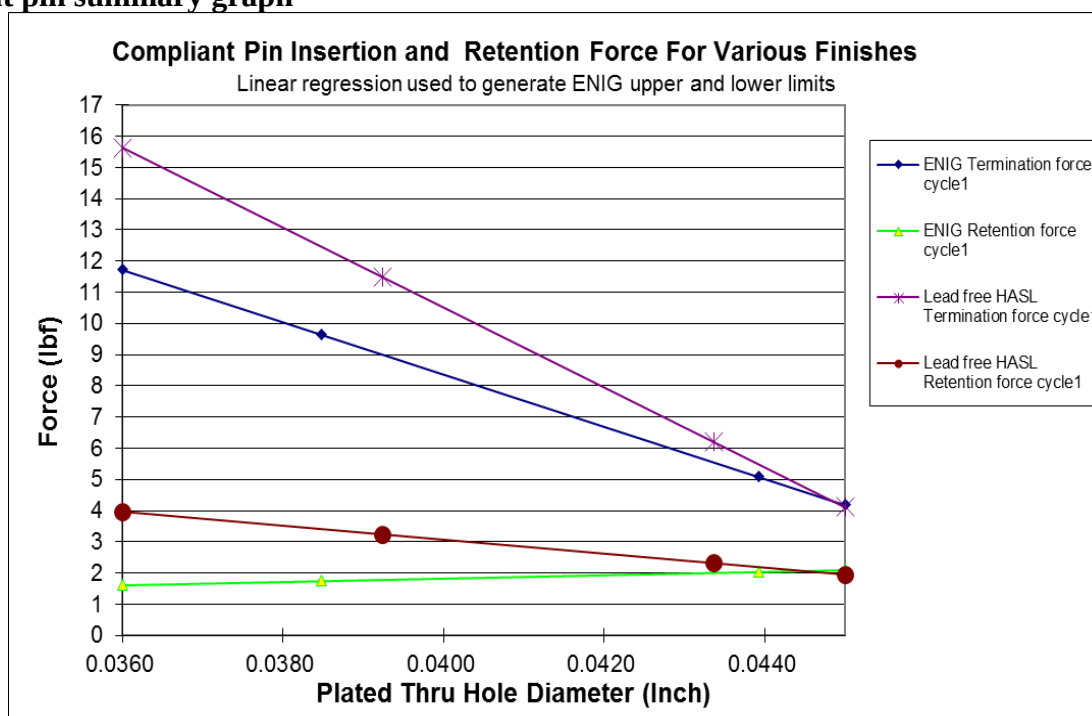
Cycle 1		Cycle 3	
Insertion Force Summary		Insertion Force Summary	
Minimum	5.10	Minimum	3.95
Maximum	7.33	Maximum	6.52
Average	5.94	Average	5.19
St. Dev.	0.54	St. Dev.	0.65
Cycle 1		Cycle 3	
Retention Force Summary		Retention Force Summary	
Minimum	1.55	Minimum	1.14
Maximum	3.08	Maximum	2.62
Average	2.09	Average	1.87
St. Dev.	0.33	St. Dev.	0.38

DATA SUMMARIES Continued**ENIG 0.039" PTH (Cage)**

Cycle 1		Cycle 3	
Insertion Force Summary		Insertion Force Summary	
Minimum	7.33	Minimum	6.83
Maximum	11.97	Maximum	8.69
Average	9.45	Average	7.61
St. Dev.	0.95	St. Dev.	0.43
Cycle 1		Cycle 3	
Retention Force Summary		Retention Force Summary	
Minimum	1.07	Minimum	0.80
Maximum	2.43	Maximum	2.00
Average	1.60	Average	1.25
St. Dev.	0.35	St. Dev.	0.29

ENIG 0.043" PTH (Cage)

Cycle 1		Cycle 3	
Insertion Force Summary		Insertion Force Summary	
Minimum	4.03	Minimum	3.64
Maximum	6.15	Maximum	5.17
Average	5.01	Average	4.29
St. Dev.	0.55	St. Dev.	0.41
Cycle 1		Cycle 3	
Retention Force Summary		Retention Force Summary	
Minimum	1.54	Minimum	1.32
Maximum	2.56	Maximum	2.16
Average	2.02	Average	1.64
St. Dev.	0.23	St. Dev.	0.19

Compliant pin summary graph

Tracking Code:1299240_Report_Rev_2	Part #: QSFPC-1-1-S-F/QSFPO-XXX-XXX-01-XX-X
Part description: QFSPC/QSFPO	

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: HZ-TCT-01

Description: Normal force analyzer

Manufacturer: Mecmesin Multitester

Model: Mecmesin Multitester 2.5-i

Serial #: 08-1049-04

Accuracy: Last Cal: 2017-4-28, Next Cal: 2018-4-27