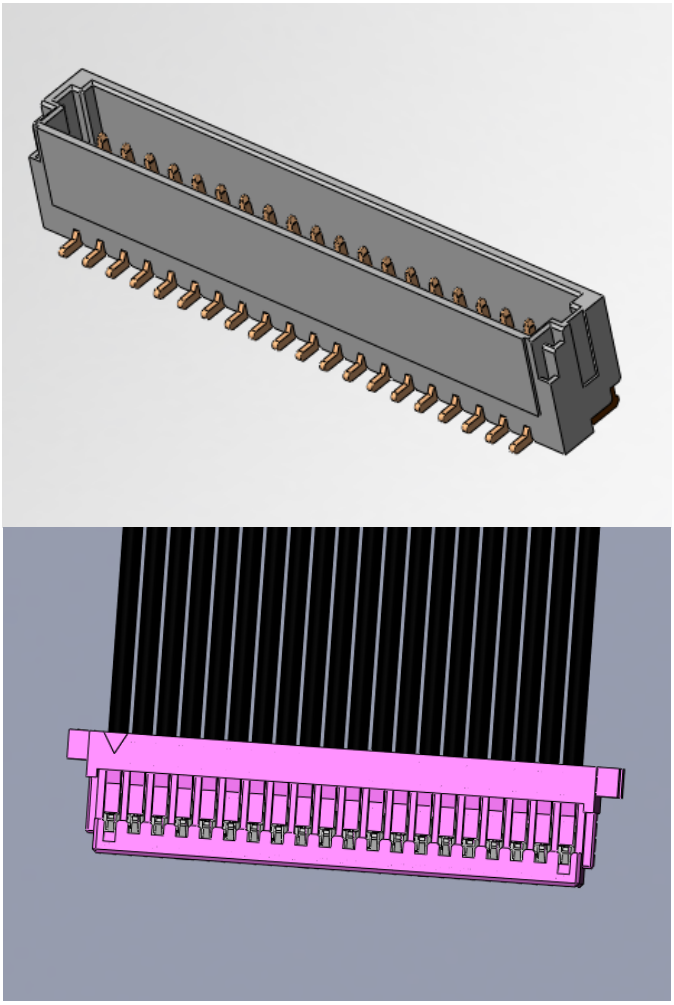
Project Number: Design Qualification Test Report	Tracking Code: 144976_Report_Rev_5
Requested by: Steven Xu	Date: 8/10/2021
Part #: S1SS-05-28C-GF-06.0-L1/T1M-05-F-SV-L-TR	
Part description: S1SS /T1M	Tech: Peter Chen
Test Start: 5/25/2011	Test Completed: 8/30/2011



Design Qualification Test Report

T1M/S1SS
S1SS-05-28C-GF-06.0-L1/T1M-05-F-SV-L-TR

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
01/10/2014	**3**	**Updated the CCC data**	**PC**
05/13/2016	**4**	**Add the # 609915 data**	**PC**
8/10/2021	**5**	**Remove test data for Tin plating**	**KH**

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: 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) Solder Information: Lead free
4) Samtec Test PCBs used: PCB-102657-TST-XX, PCB-106921-TST-XX.

FLOWCHARTS

Mating/Unmating/Durability

Note: Remove latch for mating/unmating force.

Group 1 S1SS-05-28C-GF-06.0-L1 T1M-05-F-SV-L-TR 8 Assemblies		Group 2 S1SS-02-28C-GF-06.0-L1 T1M-02-F-SV-L-TR 8 Assemblies	
Step	**Description**	**Step**	**Description**
1.	Contact Gaps	1.	Contact Gaps
2.	Mating/Unmating Force (1)	2.	Mating/Unmating Force (1)
3.	Cycles Quantity = 25 Cycles	3.	Cycles Quantity = 25 Cycles
4.	Mating/Unmating Force (1)	4.	Mating/Unmating Force (1)
5.	Cycles Quantity = 25 Cycles	5.	Cycles Quantity = 25 Cycles
6.	Mating/Unmating Force (1)	6.	Mating/Unmating Force (1)
7.	Cycles Quantity = 25 Cycles	7.	Cycles Quantity = 25 Cycles
8.	Mating/Unmating Force (1)	8.	Mating/Unmating Force (1)
9.	Cycles Quantity = 25 Cycles	9.	Cycles Quantity = 25 Cycles
10.	Mating/Unmating Force (1)	10.	Mating/Unmating Force (1)

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

Cable Pull

Group 1 S1SS-05-28C-GF-18.0-L1 T1M-05-F-SV-L-TR 5 Assemblies 0 Degrees		Group 2 S1SS-05-28C-GF-18.0-L1 T1M-05-F-SV-L-TR 5 Assemblies 90 Degrees	
Step	**Description**	**Step**	**Description**
1.	Cable Pull (1)	1.	Cable Pull (1)

(1) Cable Pull = EIA-364-38
Measure and Record Force Required to Failure
Failure = Discontinuity >1 microsecond at 10 ohms

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.

CABLE 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
90° Connector pull

RESULTS

Mating /Unmating force:

S1SS-05-28C-GF-06.0-L1/T1M-05-F-SV-L-TR

- **Initial**
  - **Mating**
    - **Min ---------- 0.79 Lbs**
    - **Max---------- 1.16 Lbs**
  - **Unmating**
    - **Min ---------- 0.46 Lbs**
    - **Max---------- 0.94 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 0.96 Lbs**
    - **Max---------- 1.17 Lbs**
  - **Unmating**
    - **Min ---------- 0.60 Lbs**
    - **Max---------- 0.77 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 0.97 Lbs**
    - **Max---------- 1.35 Lbs**
  - **Unmating**
    - **Min ---------- 0.66 Lbs**
    - **Max---------- 0.78 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 0.99 Lbs**
    - **Max---------- 1.45 Lbs**
  - **Unmating**
    - **Min ---------- 0.73 Lbs**
    - **Max---------- 0.82 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 1.06 Lbs**
    - **Max---------- 1.53 Lbs**
  - **Unmating**
    - **Min ---------- 0.77 Lbs**
    - **Max---------- 0.84 Lbs**

RESULTS Continued

S1SS-02-28C-GF-06.0-L1/T1M-02-F-SV-L-TR

- **Initial**
  - **Mating**
    - **Min ---------- 0.21 Lbs**
    - **Max---------- 0.29 Lbs**
  - **Unmating**
    - **Min ---------- 0.19 Lbs**
    - **Max---------- 0.28 Lbs**
- **After 25 Cycles**
  - **Mating**
    - **Min ---------- 0.27 Lbs**
    - **Max---------- 0.39 Lbs**
  - **Unmating**
    - **Min ---------- 0.20 Lbs**
    - **Max---------- 0.34 Lbs**
- **After 50 Cycles**
  - **Mating**
    - **Min ---------- 0.33 Lbs**
    - **Max---------- 0.46 Lbs**
  - **Unmating**
    - **Min ---------- 0.22 Lbs**
    - **Max---------- 0.37 Lbs**
- **After 75 Cycles**
  - **Mating**
    - **Min ---------- 0.34 Lbs**
    - **Max---------- 0.49 Lbs**
  - **Unmating**
    - **Min ---------- 0.24 Lbs**
    - **Max---------- 0.38 Lbs**
- **After 100 Cycles**
  - **Mating**
    - **Min ---------- 0.36 Lbs**
    - **Max---------- 0.50 Lbs**
  - **Unmating**
    - **Min ---------- 0.24 Lbs**
    - **Max---------- 0.38 Lbs**

RESULTS Continued

Cable pulls force：（S1SS-05-28C-GF-06.0-L1/T1M-05-F-SV-L-TR）

- **0° Pull**
  - **Min ---------- 5.18 Lbs**
  - **Max---------- 5.80 Lbs**
- **90° Pull**
  - **Min ---------- 3.76 Lbs**
  - **Max---------- 5.10 Lbs**

DATA SUMMARIES

MATING/UNMATING FORCE:

S1SS-05-28C-GF-06.0-L1/T1M-05-F-SV-L-TR

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	3.51	0.79	2.05	0.46	4.27	0.96	2.67	0.60
Maximum	5.16	1.16	4.18	0.94	5.20	1.17	3.42	0.77
Average	4.66	**1.05**	2.75	**0.62**	4.98	**1.12**	3.02	**0.68**
St Dev	0.61	0.14	0.75	0.17	0.30	0.07	0.27	0.06
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	4.31	0.97	2.94	0.66	4.40	0.99	3.25	0.73
Maximum	6.00	1.35	3.47	0.78	6.45	1.45	3.65	0.82
Average	5.10	**1.15**	3.26	**0.73**	5.24	**1.18**	3.45	**0.78**
St Dev	0.48	0.11	0.18	0.04	0.62	0.14	0.14	0.03
Count	8	8	8	8	8	8	8	8

	After 100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	4.71	1.06	3.42	0.77
Maximum	6.81	1.53	3.74	0.84
Average	5.51	**1.24**	3.55	**0.80**
St Dev	0.61	0.14	0.11	0.03
Count	8	8	8	8

DATA SUMMARIES Continued

S1SS-02-28C-GF-06.0-L1/T1M-02-F-SV-L-TR

	Initial				After 25 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	0.93	0.21	0.85	0.19	1.20	0.27	0.89	0.20
Maximum	1.29	0.29	1.25	0.28	1.73	0.39	1.51	0.34
Average	1.13	**0.26**	0.98	**0.22**	1.44	**0.32**	1.17	**0.26**
St Dev	0.12	0.03	0.14	0.03	0.23	0.05	0.19	0.04
Count	8	8	8	8	8	8	8	8

	After 50 Cycles				After 75 Cycles			
	Mating		**Unmating**		**Mating**		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	1.47	0.33	0.98	0.22	1.51	0.34	1.07	0.24
Maximum	2.05	0.46	1.65	0.37	2.18	0.49	1.69	0.38
Average	1.76	**0.40**	1.24	**0.28**	1.84	**0.41**	1.31	**0.29**
St Dev	0.20	0.05	0.21	0.05	0.25	0.06	0.20	0.04
Count	8	8	8	8	8	8	8	8

	After 100 Cycles			
	Mating		**Unmating**	
	Newtons	Force (Lbs)	Newtons	Force (Lbs)
Minimum	1.60	0.36	1.07	0.24
Maximum	2.22	0.50	1.69	0.38
Average	1.91	**0.43**	1.31	**0.30**
St Dev	0.18	0.04	0.21	0.05
Count	8	8	8	8

DATA SUMMARIES Continued

Cable pulls force:

0° Pull

	Force (lbs)
Minimum	**5.18**
Maximum	5.80
Average	5.47

90° Pull

	Force (lbs)
Minimum	**3.76**
Maximum	5.10
Average	4.67

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: 2016-4-28, Next Cal: 2017-4-27