Qualification Test Report

Report ID: 501-161285
Rev. A

Project No.:	PRJ-21-000903170	**Request ID:**	P21-903170-03
Customer:	General	**Date of Report:**	2024-02-21
Specification:	LV214 March 2010	**Type of Testing:**	Support Sales
Validation Purpose	Product validation of TMF 4P Plug Housing.	**Conclusion:**	**Test Passed**

Validated Product:		**Result Assignable to Product:**	
P/N	**Description**	**P/N**	**Description**
X-2389993-X	TMF 4P Plug Housing	/	/

Qualification Matrix			
Test Item	**Test Group Description**	**Results**	**Laboratory Report No.**
1	PG7 Handling and functional reliability of the housing	✓	R21-903170-03 Rev.A Tested Period: 2022/6/23 to 2022/7/30
2	PG17 Dynamic load	✓	

Remark: 1) 1.2.3… in blank means test sequence, ✓ – passed / X – failed / – – not performed / △ – reference &value determination / * supporting document and no result was assigned from laboratory.

Test Engineer:	**Approved by / Supervisor:**	**Released by / Manager:**
Li, Jinqiang	**Zhu, Zhen**	**Mao, Robert**

1. General Information

1.1. Test Sample Information

Part Number	Rev.	Description	Sample Qty	Received Date	Production Date	Remark
X-2389993-X	A	TMF 4P PLUG	25	PBT	2022/04/24	-
AMS22D-40MZ5-A	-	RSB HFM 4P 90D header	25	-	-	-

Table 1 Sample information

Figure 1 Sample overview

1.2. Test Equipment List

Equipment Name	Model No.	Lab Equipment No.	Calibration Due Date	Remark
Insulation Resistance Tester	KIKUSUI T0S9201	SZE1-037	2022/09/10	-
Resistance meter	HIOKI RM3545-02	SZE1-023	2022/11/23	-
ZwickiLine Testing Machine	Zwick-1kN	SZE2-004	2022/09/14	-
Moment Disconnection Analyzer	NMS10	SZE1-048	2022/12/01	-
EMIC Vibration Table	FV-60K/100	SZE2-003	2023/04/13	-

Table 2 Equipment list

2. Test Description

2.1. PG7 Handling and functional reliability of the housing

2.1.1. Visual Inspection

Acceptance Criteria	The device under test must not show, any evidence of deterioration, cracks, deformities, etc. that could affect their functionality.
Test Result	Passed

2.1.2. Connector Engagement Force

Acceptance Criteria	Increase the mating force at a uniform rate of 50+/-10mm/min until complete mating occurs.. F≤45N.
Test Result	Passed

2.1.3. Connector Disengagement Force with Lock Enabled

Acceptance Criteria	Increase the retention force at a uniform rate not to exceed 50mm/min. until complete separation occurs. F≥110N.
Test Result	Passed

2.1.4. Connector Disengagement Force with Lock Disabled

Acceptance Criteria	Increase the retention force at a uniform rate not to exceed 50mm/min. until complete separation occurs. F≤45N.
Test Result	Passed

2.2. PG17 Dynamic load

2.2.1. Visual Inspection

Acceptance Criteria	The device under test must not show, any evidence of deterioration, cracks, deformities, etc. that could affect their functionality.
Test Result	Passed

2.2.2. Isolation Resistance

Acceptance Criteria	Apply the test voltage U = 500 V DC continuously for at least t = 60 s. 100 MΩ min
Test Result	Passed

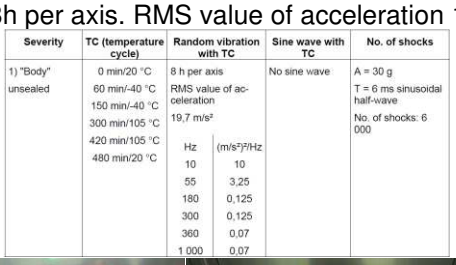
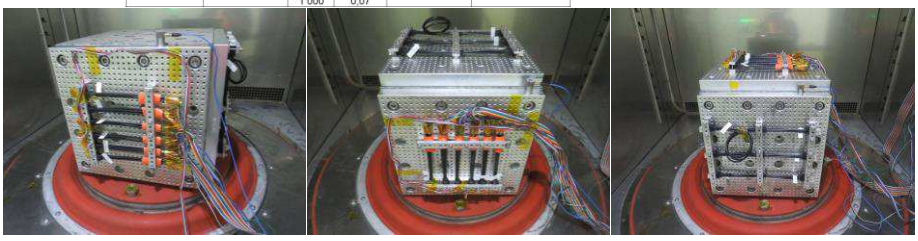
2.2.3. Dielectric Withstand Voltage

Acceptance Criteria	With the connector engaged, apply 500 volts of commercial frequency alternating voltage between the internal and external conductor terminals for 60 seconds. There must be no dielectric breakdowns.
Test Result	Passed

2.2.4. Connector Cycling

Acceptance Criteria	Completely mate and un-mate each connector or terminal pair 10 times. After test meet the next following tests.
Test Result	Passed

2.2.5. Vibration / Mechanical Shock

Acceptance Criteria	Vibration: 8h per axis. RMS value of acceleration 19.7m/s².  Severity: 1) "Body" unsealed TC (temperature cycle): 0 min/20 °C; 60 min/-40 °C; 150 min/-40 °C; 300 min/105 °C; 420 min/105 °C; 480 min/20 °C Random vibration with TC: 8 h per axis; RMS value of acceleration 19,7 m/s² Hz / (m/s²)²/Hz: 10 / 10; 55 / 3,25; 180 / 0,125; 300 / 0,125; 360 / 0,07; 1 000 / 0,07 Sine wave with TC: No sine wave No. of shocks: A = 30 g; T = 6 ms sinusoidal half-wave; No. of shocks: 6 000  Shock: Acceleration: a=30g; Individual shock duration: t=6ms, sinusoidal half-wave; No. of shocks: 1000 per spatial axis. Meet the electric test after vibration test..
Test Result	Passed

2.2.6. Contact Resistance

Acceptance Criteria	The contact resistance is always measured according to the 4-point measuring method. Signal contact ≤15mΩ (initial & final) Outer contact ≤5mΩ (initial & final)
Test Result	Passed

2.2.7. Isolation Resistance

Acceptance Criteria	Apply the test voltage U = 500 V DC continuously for at least t = 60 s. 100 MΩ min
Test Result	Passed

2.2.8. Dielectric Withstand Voltage

Acceptance Criteria	With the connector engaged, apply 500 volts of commercial frequency alternating voltage between the internal and external conductor terminals for 60 seconds. There must be no dielectric breakdowns.
Test Result	Passed

2.2.9. VSWR / RF Test

Acceptance Criteria	Impedance refers to DIN EN 60512-25-7. Insertion loss refers to DIN EN 60512-25-2. Return loss refers to DIN EN 60512-25-5. Cross talk refers to DIN EN 60512-25-1. Impedance: 50±5 Ohm Insertion loss:>-0.01*Sqrt(F MHz) Return loss: 0~1GHz <-23dB 1~2GHz <-26dB+3*f(GHz) 2~5GHz <-20dB 5~6GHz <-45dB+5*f(GHz) 6~9GHz <-15dB
Test Result	Passed

Document History

Change Date	Rev.	Page	Main Changes	Name
2024-02-21	A	-	First release	Jinqiang Li

End of Test Report