



SGI 1.25 Dual Row Qualification Test Report

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) SGI 1.25 dual row 20/40pos connector to determine its conformance to the requirements of 108-106451.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of SGI 1.25 dual row 20/40pos connector. Testing was performed at Shanghai Test Laboratory. The test file numbers below for this testing are on file and maintained at TE Shanghai Electrical Components Test Laboratory.

- TP-20-02686-RECORD
- TP-20-02633-RECORD
- TP-21-02252-RECORD
- TP-21-02698-RECORD
- TP-21-02888-RECORD

1.3. Conclusion

All part numbers listed in paragraph 1.5 conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-106451.

1.4. Product Description

The SGI 1.25 dual row 20/40pos connector is designed to accept 26-30 AWG wires with a 1.25mm centerline.

1.5. Test Specimens

The test specimens were representative of normal production lots, and the following part numbers were used for testing (See table 1).

1.6. Revision History

- Initial release

Table 1 – Specimen Identification

Test Group	Qty	Part Number	Description
1	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	3-2376974-0	Header Assy, 30pos, VT, KeyA, SGI 1.25
	2	3-2376950-0	Plug HSG, VT, KeyA, 30pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	180	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
2	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
3	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
4	9	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	9	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	9	3-2376974-0	Header Assy, 30pos, VT, KeyA, SGI 1.25
	9	3-2376950-0	Plug HSG, VT, KeyA, 30pos, SGI 1.25
	9	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	9	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	270	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
	270	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 28AWG
	270	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 30AWG
5	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm
6	10	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
	10	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 28AWG
	10	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 30AWG
7	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
8	5	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	20	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
9	3	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	3	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	3	3-2376974-0	Header Assy, 30pos, VT, KeyA, SGI 1.25
	3	3-2376950-0	Plug HSG, VT, KeyA, 30pos, SGI 1.25
	3	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	3	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	270	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
10	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
11	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
12	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25

	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
13	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
14	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG
15	2	2-2376974-0	Header Assy, 20pos, VT, KeyA, SGI 1.25
	2	2-2376950-0	Plug HSG, VT, KeyA, 20pos, SGI 1.25
	2	4-2376974-0	Header Assy, 40pos, VT, KeyA, SGI 1.25
	2	4-2376950-0	Plug HSG, VT, KeyA, 40pos, SGI 1.25
	120	2371403-1	Receptacle Crimp Terminal, SGI 1.25mm, 26AWG

1.7. Qualification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TEST SEQUENCE (b)														
Initial examination of product	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LLCR	3,7	2,4	2,5									2,4	2,4	2,4	2,4
Withstanding Voltage					3,7										
Insulation Resistance					2,6										
Temperature Rise vs. Current				2											
Sinusoidal Vibration	5														
Mechanical Shock	6														
Durability	4														
Durability Preconditioning			3												
Connector Mating Force	2														
Connector Unmating Force	8														
Crimp Tensile Strength						2									
Contact Insertion Force							2								
Contact Retention Force							3								
Resistance to Soldering Heat							2								
Connector Locking Strength									2						
Post Retention Force										2					
Solderability											2				
Thermal Shock					4										
Humidity/Temperature Cycling			4		5										
Temperature Life		3													
Salt Spray												3			
Hydrogen Sulfide													3		
Ammonia														3	
Resistance to Cold															3
Final Examination of Product	9	5	6	3	8	3	3	4	3	3	3	5	5	5	5

Table 2 – Test Sequence



NOTE

- (a) See Paragraph 1.5
(b) Numbers indicate sequence which tests were performed.

1.8. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C
Relative Humidity: 20% to 80%

2. SUMMARY OF TESTING

Group	SN	Test Item	Pos	Test Result				Requirement	Conclusion
				Max	Min	Avg	Unit		
1	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Connector Mating Force	20	65.4	54.8	60.1	N	80 max.	Meet
			30	107.1	83.7	95.4	N	120 max.	Meet
			40	114.8	105.6	110.2	N	160 max.	Meet
	3	LLCR	20	10.73	4.13	4.81	mΩ	20 max.	Meet
			30	12.20	4.00	4.95	mΩ		Meet
			40	12.71	12.20	10.73	mΩ		Meet
	4	Durability	-	No physical damage			-	No physical damage	Meet
	5	Sinusoidal Vibration	-	No physical damage or no electrical discontinuity greater than 1 μs			-	No physical damage or no electrical discontinuity greater than 1 μs	Meet
	6	Mechanical Shock	-	No physical damage or no electrical discontinuity greater than 1 μs			-	No physical damage or no electrical discontinuity greater than 1 μs	Meet
	7	LLCR	20	8.23	3.67	5.41	mΩ	40 max.	Meet
			30	11.42	3.72	5.59	mΩ		Meet
			40	8.48	3.60	5.56	mΩ		Meet
	8	Connector Unmating Force	20	21.7	18.1	19.9	N	10 min.	Meet
			30	20.9	16.0	18.45	N	15 min.	Meet
			40	27.2	21.7	24.45	N	20 min.	Meet
	9	Examination of Product	-	No physical damage			-	No physical damage	Meet

2	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	LLCR	20	4.60	3.74	4.15	mΩ	20 max.	Meet
			40	5.01	3.55	3.99	mΩ		Meet
	3	Temperature Life	-	No physical damage			-	No physical damage	Meet
	4	LLCR	20	5.09	3.37	4.05	mΩ	40 max.	Meet
			40	5.38	3.22	3.86	mΩ		Meet
3	5	Examination of Product	-	No physical damage			-	No physical damage	Meet
	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	LLCR	20	5.29	4.16	4.76	mΩ	20 max.	Meet
			40	7.15	4.14	4.75	mΩ		Meet
	3	Durability Preconditioning	-	No physical damage			-	No physical damage	Meet
	4	Humidity/Temperature Cycling	-	No physical damage			-	No physical damage	Meet
4	5	LLCR	20	6.04	4.42	5.05	mΩ	40 max.	Meet
			40	6.93	4.19	4.94	mΩ		Meet
	6	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Temperature Rise vs. Current	20	< 30			°C	30 max. @ rated current	Meet
			30	< 30			°C		Meet
			40	< 30			°C		Meet
5	3	Examination of Product	-	No physical damage			-	No physical damage	Meet
	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
5	2	Insulation Resistance	-	4350	660	1580	10 ⁹ Ω	0.5 min.	Meet

	3	Withstand Voltage	-	No breakdown or flashover			-	No breakdown or flashover	Meet
	4	Thermal Shock	-	No physical damage			-	No physical damage	Meet
	5	Humidity/Temperature Cycling	-	No physical damage			-	No physical damage	Meet
	6	Insulation Resistance	-	29.6	7.6	15.9	10 ⁹ Ω	0.1 min.	Meet
	7	Withstand Voltage	-	No breakdown or flashover			-	No breakdown or flashover	Meet
	8	Examination of Product	-	No physical damage			-	No physical damage	Meet
6	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Crimp Tensile Strength	-	41.6	30.0	39.0	N	20 min. for 26AWG	Meet
				29.0	21.5	25.6	N	11 min. for 28AWG	Meet
				13.9	6.8	9.6	N	6 min. for 30AWG	Meet
	3	Examination of Product	-	-			-	-	Meet
7	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Resistance to Soldering Heat	-	No physical damage			-	No physical damage	Meet
	3	Examination of Product	-	No physical damage			-	No physical damage	Meet
8	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Contact Insertion Force	-	2.6	1.8	2.25	N	7.84 max.	Meet
	3	Contact Retention Force	-	18.9	14.5	16.9	N	10 min.	Meet
	4	Examination of Product	-	-			-	-	Meet

9	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Connector Locking Strength	20	119.1	107.3	114.2	N	50 min.	Meet
			30	114.5	101.7	108.8	N		Meet
			40	122.2	102.9	112.7	N		Meet
	3	Examination of Product	-	-			-	-	Meet
10	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Post Retention Force	20	20.5	16.2	17.9	N	10 min.	Meet
			40	24.6	18.6	21.8	N		Meet
	3	Examination of Product	-	-			-	-	Meet
11	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	Solderability	-	Wet solder coverage 95% Min			-	Wet solder coverage 95% Min	Meet
	3	Examination of Product	-	No physical damage			-	No physical damage	Meet
12	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	LLCR	20	4.77	3.35	4.14	mΩ	20 max.	Meet
			40	7.42	1.96	4.12	mΩ		Meet
	3	Salt Spray	-	No physical damage			-	No physical damage	Meet
	4	LLCR	20	6.74	1.85	4.43	mΩ	40 max.	Meet
			40	24.32	2.80	4.55	mΩ		Meet
	5	Examination of Product	-	No physical damage			-	No physical damage	Meet
13	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	LLCR	20	5.47	4.31	4.88	mΩ	20 max.	Meet
			40	5.11	3.65	4.44	mΩ		Meet

	3	Hydrogen Sulfide	-	No physical damage			-	No physical damage	Meet
	4	LLCR	20	7.02	4.46	5.20	mΩ	40 max.	Meet
			40	8.32	4.11	5.18	mΩ		Meet
	5	Examination of Product	-	No physical damage			-	No physical damage	Meet
14	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	LLCR	20	5.01	3.54	4.13	mΩ	20 max.	Meet
			40	6.65	3.57	4.36	mΩ		Meet
	3	Ammonia	-	No physical damage			-	No physical damage	Meet
	4	LLCR	20	5.08	3.25	4.13	mΩ	40 max.	Meet
			40	4.48	3.16	3.87	mΩ		Meet
	5	Examination of Product	-	No physical damage			-	No physical damage	Meet
15	1	Examination of Product	-	No physical damage			-	No physical damage	Meet
	2	LLCR	20	4.48	3.53	3.86	mΩ	20 max.	Meet
			40	4.48	3.53	3.79	mΩ		Meet
	3	Resistance to Cold	-	No physical damage			-	No physical damage	Meet
	4	LLCR	20	6.42	3.22	3.97	mΩ	40 max.	Meet
			40	4.89	3.11	3.85	mΩ		Meet
	5	Examination of Product	-	No physical damage			-	No physical damage	Meet

3. TEST METHODS

3.1. Initial/Final Examination of Product

Testing was performed in accordance with EIA-364-18. Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

3.2. LLCR

Testing was performed in accordance with EIA 364-23 using a test current of 100 mA and a test voltage limited to 20mV.

3.3. Withstand Voltage

Testing was performed in accordance with EIA-364-20, condition I. A test potential of 500VAC was applied by the adjacent contacts of mated specimens. This potential was applied for 1 minute and then returned to zero.

3.4. Insulation Resistance

Measure and record the insulation resistance separately between the closest adjacent contacts at 500VDC for 1 minutes. Measure and record the performance of the specimens. Execute visual check after test.

3.5. Temperature Rising

Testing was performed in accordance with EIA-364-70C. Thermocouples were soldered to each test specimen. Test specimens were connected in series in a draft free chamber. Each test current was applied until specimen temperatures were stable, then recorded. Stability occurred when 3 consecutive temperature measurements taken at 5 minutes intervals did not differ by more than 1°C.

3.6. Sinusoidal Vibration

Testing was performed in accordance with EIA-364-28, Condition I, Subject mated specimens to 10 to 55 to 10Hz traversed in 1 minute with 1.5 mm maximum total excursion. Two hours in each of 3 mutually perpendicular planes.

3.7. Mechanical Shock

Testing was performed in accordance with EIA-364-27, Condition H. Subject mated connector to 30G's half -sine shock pulse of 11 ms duration. 3 drops each to normal and reversed directions of X, Y and Z axis. Total of 18 drops.

3.8. Durability / Durability Preconditioning

Testing was performed by mating and unmating test specimens for 5 or 25 cycles at a maximum rate of 500 cycles per hour.

3.9. Connector Mating Force

Testing was performed in accordance with EIA-364-13, method A. Mating force was measured with a tensile/compression machine. The plug housing was held in a vice mounted to an X-Y table rigidly clamped to the base of the tensile/compression testing machine. The moveable crosshead was lowered at a rate of 12.7 mm/min until the specimen was fully mated. The peak force required to mate the connector was recorded.

3.10. Connector Unmating Force

Testing was performed in accordance with EIA-364-13, method A. Unmating force was measured with a tensile/compression machine. The plug housing was held in a vice mounted to an X-Y table rigidly clamped to the base of the tensile/compression testing machine with the latch disengaged. The moveable crosshead was raised at a rate of 12.7 mm/min until the specimen was fully unmated. The peak force required to unmate the connector was recorded.

3.11. Crimp Tensile Strength

Testing was performed in accordance with EIA-364-8. The force load was applied to each specimen using a tensile/compression device with the rate of travel at 50 mm per minute. The load is applied in axial directions as specified.

3.12. Contact Insertion Force

Testing was performed in accordance with IEC-364-5. Contact insertion force was measured by applying an increasing force to each contact using a tensile/compression device with a rate of travel at 25.4 mm per minute until the contact was properly seated in the housing.

3.13. Contact Retention Force

Testing was performed in accordance with EIA-364-29, method C. Contact retention force was measured by applying an increasing force to each contact using a tensile/compression device with a rate of travel at 25.4 mm per minute until the contact was dislodged from the housing.

3.14. Resistance to Soldering Heat

Testing was performed in accordance with 109-201 condition B. Specimens were subjected to solder temperature $260 \pm 5^\circ\text{C}$ for 5 ± 2 Second.

3.15. Connector Locking Strength

Testing was performed in accordance with EIA-364-98. Connector locking force was measured by applying an increasing force to plug using a tensile/compression device with a rate of travel at 13 mm per minute until the plug was dislodged from the header assembly.

3.16. Post Retention Force

Testing was performed in accordance with EIA-364-29. The force load was applied to each post contact using a tensile/compression device with the rate of travel at 25.4 mm per minute.

3.17. Solderability

Testing was performed in accordance with TEC-109-11 Method B, solder Temperature: $245 \pm 5^\circ\text{C}$, immersion duration: 3 ± 0.5 s.

3.18. Thermal Shock

Subject mated specimens to 10 cycles between -55 and 105°C with 30 minutes dwells at temperature extremes and 5 minutes transition between temperatures.

3.19. Humidity-Temperature Cycling

Testing was performed in accordance with EIA-364-31, method III. Subject mated specimen to 10 cycles between 25°C and 65°C at 90-95% RH. Measurements to be recorded after specimens are held for 3 hours at ambient temperature and humidity. 1 cycle is 24 hours.

3.20. Temperature Life

Testing was performed in accordance with EIA-364-17, method A. Subject mated connector to $105 \pm 2^\circ\text{C}$ for a duration of 96 hours. Measurements to be recorded after specimens are held for 3 hours at ambient temperature and humidity.

3.21. Salt Spray

Testing was performed in accordance with EIA-364-26, test condition B. Mated specimens were subjected to a 5% salt spray environment for 48 hours. The temperature of the box was maintained at 35°C while the pH of the salt solution was between 6.5 and 7.2.

3.22. Hydrogen Sulfide

Mated specimens were subjected to a 3 ± 1 ppm H_2S environment for 96 hours at a temperature of $40 \pm 2^\circ\text{C}$.

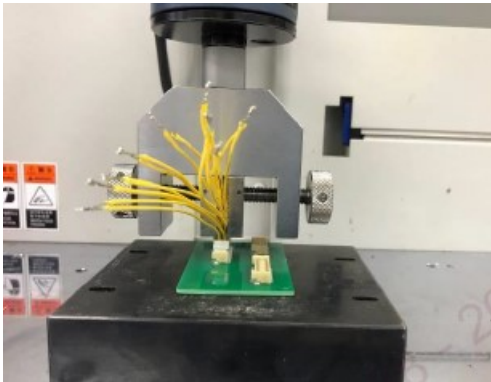
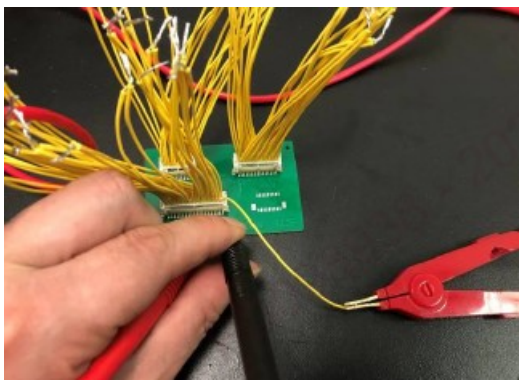
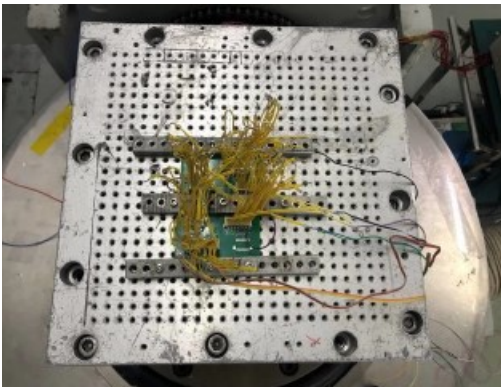
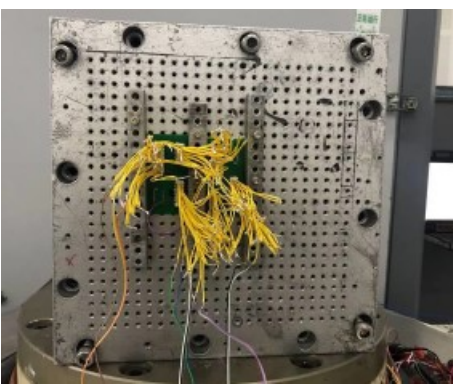

3.23. Ammonia


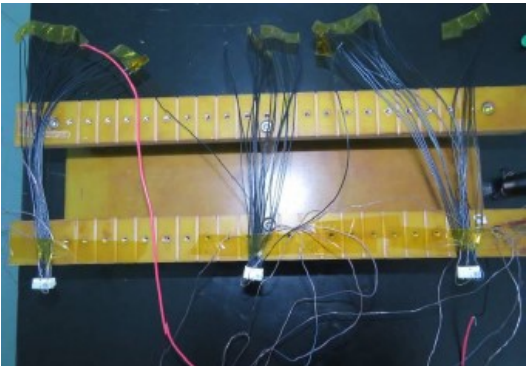
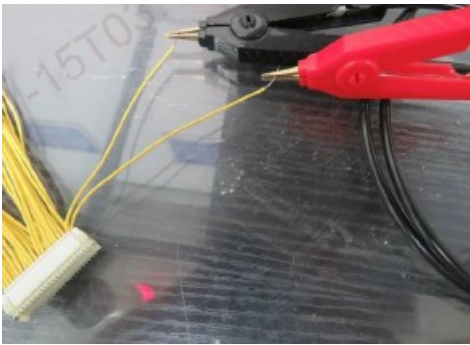

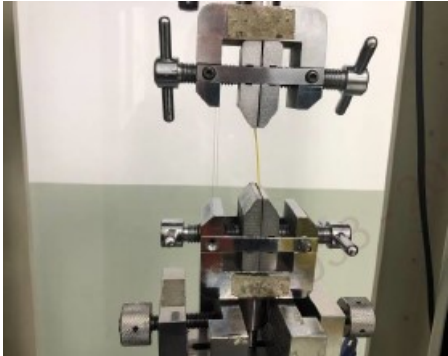
Mated specimens were subjected to 25 mL/L of 3% NH₃ solution environment for 7 hours.

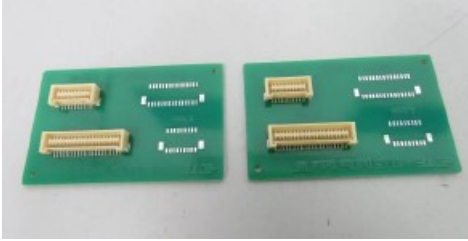

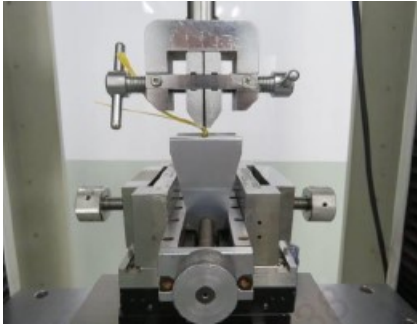

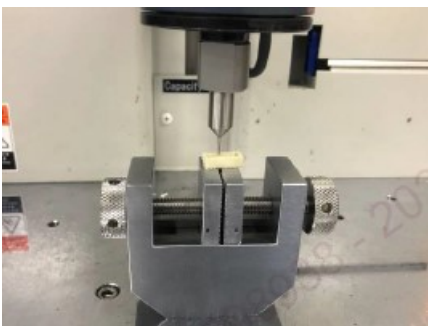
3.24. Resistance to Cold

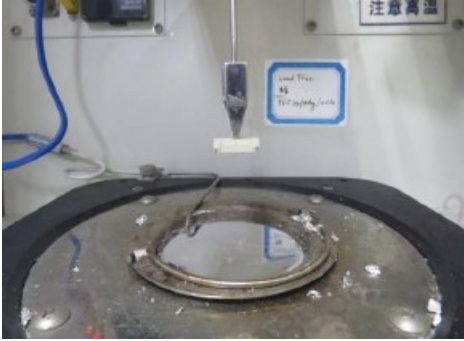



Testing was performed in accordance with IEC 60068-2-1. Mated specimens were placed in a cold storage unit at a temperature of $-40\pm 2^{\circ}\text{C}$ for 96 hours.

APPENDIX

Test Group	Pictures	
1	 <p data-bbox="467 741 750 772">Connector Mating Force</p>	 <p data-bbox="1144 741 1214 772">LLCR</p>
	 <p data-bbox="492 1203 727 1234">Sinusoidal Vibration</p>	 <p data-bbox="1071 1203 1291 1234">Mechanical Shock</p>
2	 <p data-bbox="506 1612 711 1644">Temperature Life</p>	

3	 <p>Humidity/Temperature Cycling</p>	
4	 <p>Temperature Rise</p>	
5	 <p>Insulation Resistance</p>	 <p>Thermal Shock</p>
6	 <p>Crimp Tensile Strength</p>	

7	 <p>Resistance to Soldering Heat</p>	
8	 <p>Contact Insertion Force</p>	 <p>Contact Retention Force</p>
9	 <p>Connector Locking Strength</p>	
10	 <p>Post Retention Force</p>	

11	 <p>Solderability</p>	
12	 <p>Salt Spray</p>	
13	 <p>Hydrogen Sulfide</p>	
14	 <p>Ammonia</p>	

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Resistance to Cold