

1. Scope :

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of LIF (Low Insertion Force) Connector.

Applicable product description and part numbers are as shown in Appendix 1.

2. Applicable Documents :

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 AMP Specifications :

- | | | |
|----|----------|---|
| A. | 109-5000 | Test Specification, General Requirements for Test Methods |
| B. | 114-5217 | Application Specification,
Crimping of .040 III Unsealed Contact, Receptacle |
| C. | 114-5160 | Application Specification,
Crimping of .070 II Unsealed Contact, Receptacle |
| D. | 501-5304 | Test Report |

2.2 Commercial Standards and Specifications.

- | | | |
|----|-----------|--|
| A. | JASO D605 | Electric Connector for Automobiles |
| B. | JASO M312 | Test Methods for Plastic Molded Parts |
| C. | JASO D611 | Low Voltage Wires and Cables for Automobiles |
| D. | JIS D0204 | Method of High and Low Temperature Test for Automobile Parts |
| E. | JIS D1601 | Vibration Testing Method for Automobile Parts |

3. Requirements :

3.1 Design and Construction :

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Materials :

A. Contact :

Description	Material	Finish
Tab(Male)	Brass	Selective-Gold plating or Tin-Lead plating over Nickel under plating or Pre-Tinned
Receptacle(Female)	Copper alloy and Brass	Selective-Gold plating over Nickel under plating or Pre-Tinned

Fig.1

B. Housing :

- a.Flame : PBT resin
- b.Double Lock Plate : PBT resin
- c.Sub-Plug : PBT resin
- d.Cap Housing : PBT resin
- e.Tine Plate : PBT resin

C.Others

- a.Wire Cover : PP resin
- b.Lever : PBT resin

3.3 Ratings :

- A. Temperature Rating :—40°C to 105°C(Ambient temperature + temperature rise due to energized current)

3.4 Performance Requirements and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.2 All tests shall be performed in the room temperature, unless otherwise specified.

3.5 Test Requirements and Procedures Summary :

Para.	Test Items	Requirements	Procedures
3.5.1	Confirmation of product	Product shall be conforming to the requirements of applicable product drawing and Application Specification	Visually, dimensionally and functionally inspected per applicable quality inspection plan.
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	.040 10m Ω Max. (Initial) 30m Ω Max. (Final) .070 3 m Ω Max. (Initial) 6 m Ω Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10mA Max. at open circuit voltage of 20 mV. Max. Fig. 3
3.5.3	Dielectric Strength	No creeping discharge nor flashover shall occur.	1 KV AC for 1 minute. Mated connector.
3.5.4	Insulation Resistance	100 M Ω Min. (Initial) 100 M Ω Min. (Final)	Impressed voltage 500 V DC. Test between adjacent circuits of Mated connector. Fig. 4.
3.5.5	Current Leakage	10 μ A MAX. (Initial) 1mA MAX. (Final)	13V DC impressed to adjacent contact after leave mated connector at 60°C ± 5°C, 90 ~ 95% for 1hour
3.5.6	Temperature Rinsing	under loaded specified current .040 25° c MAX. .070 35° c MAX.	Measure temperature rising by engaged current: .040-2A, .070-8A Current applied to every other positions. Fig. 7
3.5.7	Durability Current Cycling	.040 30m Ω Max. (Final) .070 6 m Ω Max. (Final) Temperature Rising .040 30° c MAX. .070 40° c MAX.	Test "Current cycling(3.5.17)" after testing "Durability"(3.5.12)

Fig. 2 (To be continued)

Para.	Test Items	Requirements	Procedures
Physical Requirements			
3.5.8	Vibration (High Frequency)	No electrical discontinuity greater than 10 μ sec. shall occur. .040 30m Ω MAX.(Final) .070 6m Ω MAX.(Final)	Vibration Frequency; 10~50Hz/8min. Accelerated Velocity; 66.6m/s (6.8G) Vibration Direction,Duration and Current UP and DOWN ;4 hours .040/.070 100 μ A BACK and FORCE;2 hours .040:2A,.070:8A RIGHT and LEFT;2 hours .040:2A,.070:8A Fig.5(Apply to pattern Fig.7)
3.5.9	Contact Retention Force (Primary lock only)	39.2N MIN.	Operation Speed :200mm/min. Measure the retention force required in the axis direction
3.5.10	Contact Retention Force (With TPA)	98N MIN.	Operation Speed :200mm/min. Measure the retention force required.
3.5.11	Crimp Tensile Strength	Wire size (mm ²)	Tensile Strength (N) Min.
		0.3 (AWG#22)	58.8
		0.5 (AWG#20)	88.2
		0.85 (AWG#18)	127.4
		1.25 (AWG#16)	166.6
		2 (AWG#14)	196.0
3.5.12	Durability (Repeated Mate/ Unmating)	.040 30m Ω Max.(Final) .070 6 m Ω Max. (Final) Temperature Rising .040 30° c MAX. .070 40° c MAX.	No. of Cycles : 50 Cycles
3.5.13	Lever operating force(mate/unmate)	58N MAX.	Operation Speed; 1 rpm Measure the maximum value
3.5.14	Sub plug Retention Force	98N MIN.	Measure the retention force required.(by frame)

Fig.2 (To be continued)

Para.	Test Items	Requirements	Procedures
Physical Requirements			
3.5.15	Temperature Life (Heat Aging))	.040 30m Ω Max.(Final) .070 6 m Ω Max. (Final) Temperature Rising .040 30° c MAX. .070 40° c MAX.	100° C: 120hours mated connector
3.5.16	Fuse matching	No ignition is allowed during the test	60° c. Apply to pattern Fig.6 24hours;.040 11A,.070 22A→ 1hours;.040 14A,.070 27A Wire size;.040 0.5 mm ² ;.070 1.25 mm ²
3.5.17	Current Cycling	.040 30m Ω Max.(Final) .070 6 m Ω Max. (Final) No ignition is allowed during the test	Applied Current: .040 2A .070 8A 45minutes"ON",15minutes"OFF" 300cycles,70° C Apply to pattern Fig.7

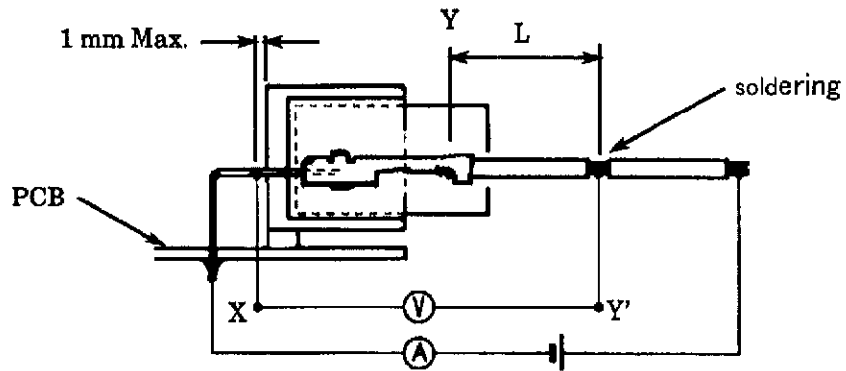
Figure 1 (End)

3.6 Product Qualification Test Sequence

Para.	Test Group											
	1	2	3	4	5	6	7	8	9	10	11	12
	Test Sequence (a)											
Confirmation	1	1	1	1	1	1	1	1	1	1	1	1
Termination Resistance (Low Level)	2		2,4	2,4	2,4					2,5		2,4
Dielectric Strength		2										
Insulation Resistance		3										
Current Leakage		4										
Temperature Rising	3		5	5						4		
Durability Current Cycling			3									
Vibration(High Frequency)					3							
contact Retention Force(primary)						2						
contact Retention Force(With TRA)						3						
Crimp Tensile Strength							2					
Durability (Repeated mate/unmating)				3								
Lever operating Force								2				
Sub plug Retention Force									2			
Temperature Life (Heat Aging)										3		
Fuse matching											2	
Current Cycling												3

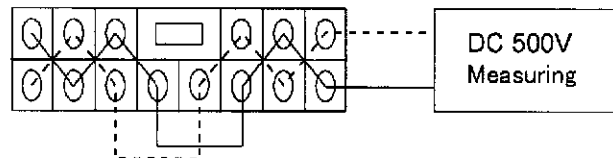
(a)Number indicate sequence in which tests are performed.

Number of specimens;Each sample group used for the specified performance test, shall consists of not less than 10 sets of contacts and less than 3 sets of connector assemblies.

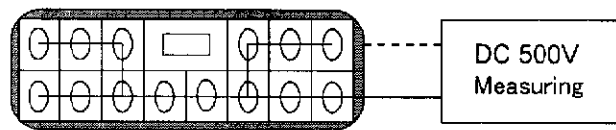


deduct the resistance of "L" long wire used for termination

Fig. 3



Between the adjacent contacts



Between the contacts and housing

Fig. 4

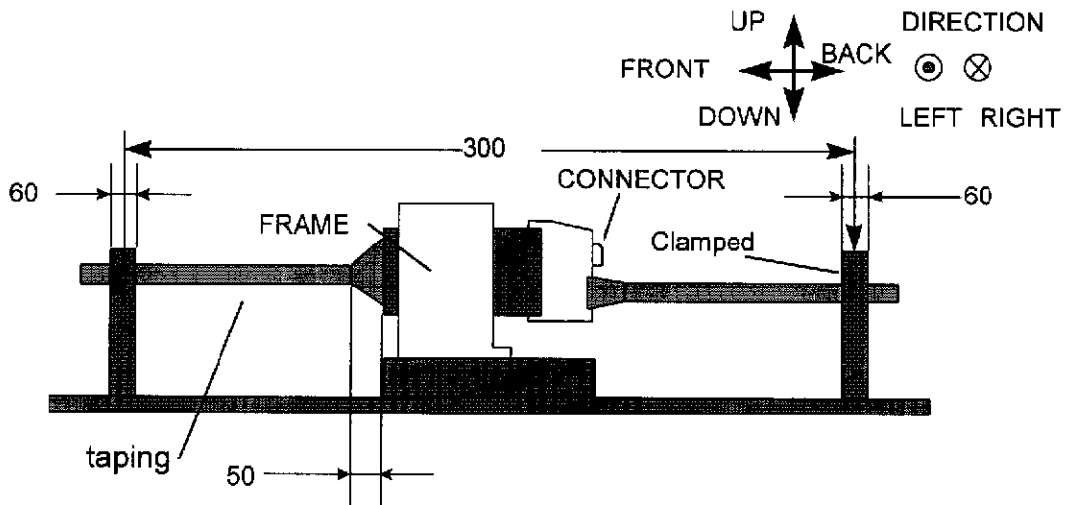


Fig. 5

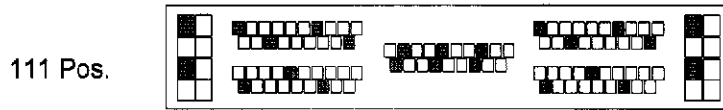
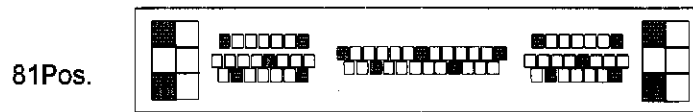


Fig. 6

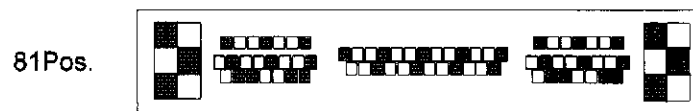


Fig. 7

The applicable product descriptions and part numbers (examples) are as shown in Appendix.1

Appendix1

Product Part No.	Description
316836	.040 III Unsealed Receptacle Contact (S) Pre-tin
316837	.040 III Unsealed Receptacle Contact (S) Au
175268	.070 II Unsealed Receptacle Contact (S) Pre-tin
175269	.070 II Unsealed Receptacle Contact (M) Pre-tin
177654	.070 II Unsealed Receptacle Contact (ML) Pre-tin
353654	81Pos. Cap Housing Assembly
353667	111Pos. Cap Housing Assembly
353659	81Pos. Frame assembly
353670	111Pos. Frame assembly
353664	7 Pos. Sub plug(81Pos.,2ea)
353665	15 Pos. Sub plug(81Pos.,2ea)
353666	25 Pos. Sub plug(81Pos.,1ea)
353675	19 Pos. Sub plug(111Pos.,5ea)
353663	81Pos. Wire Cover
353674	111Pos. Wire Cover
353662	81Pos. Lever
353673	111Pos. Lever