

2.5 Signal DBL Lock Connector 18P

1. Scope :

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 2.5 SDL 18P CAP & PLUG HSG 2row type.

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 TE connectivity Specifications :

- A. 109-5000 : Test Specification, General Requirements for Test Methods
- B. 114-5203 : Application Specification, Conditions of 2.5mm Signal Double Lock Contacts.
- C : Test Reprt

2.2 National Standards :

- A. JIS C 5402 : Method for test of connectors for use in electric equipment
- B. JIS C 0050 : Basic environmental testing Procedures : Soldering

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. Receptacle Contact: Copper-nickel-silicon-alloy (Tin PL 0.8 μm min.)
- B Tab Contact: Brass (Tin PL 0.8 μm min.)

C. Plug Housing :

6/6 Nylon (UL94V-0)

D. Cap Housing

6/6 Nylon (UL94V-0)

E. Double Lock Plate :

6/6 Nylon (Glass Filled 20%, UL94V-0)

3.3 Ratings :

- A. Voltage Rating : 50 V (AC/DC)
- :
- B. Current Rating : 3A, (2.5mm Pitch maximum)
Refer to Fig. 1 for maximum allowable current to be applied.
- C. Temperature Rating : -30 °C to 105 °C (Include temperature rising by energized current)
- D. Minimum Rating : 1mV, 1 μ A Minimum

Wire Size	Maximum Allowable Current
AWG 20	3
AWG 22	2.5
AWG 24	2.2
AWG 26	2

Fig 1

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	Examination of Product	Meets requirements of product drawing and AMP Specification 114-5203.	Visual inspection No Physical damage
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	10 M Ω Max. (Initial) 20 M Ω Max. (Final)	Subject mated contacts assembled in housing to 20mV Max open circuit at 10mA. TE Spec. 109-5311-1 Baesd on JIS C 5402 5.4
3.5.3	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur. Current leakage : 5mA Max.	1.1kVAC for 1 minute. (2.5mm Pitch) Test between adjacent circuits of mated. AMP Spec. 109-5301 Based on JIS 5402 5.1

Fig 2 (CONT.)

Para.	Test Items	Requirements	Procedures
3.5.4	Insulation Resistance	500 M Ω Min. (Initial) 500 M Ω Min. (Final)	Impressed voltage 500VDC. Test between adjacent

			circuits of mated. AMP Spec. 109-5302-4 Based on JIS C 5402 5.2	
3.5.5	Temperature Rising	30 °C Max. under loaded specified current or rating current.	Measure temperature rising by energized current. Fig. 5,6 AMP Spec. 109-5310-1 Based on JIS C 5402 5.10 Fig 5 , Fig 6	
Mechanical Requirements				
3.5.6	Crimp Tensile Strength	Wire Size		Apply an axial pull-off load to crimped wire of contact secured on the tester, Operation Speed : 100mm/min AMP Spec. 109-5205 Condition B Based on JIS C 5402 6.22 But Operation Speed shall be applicable to the above.
		mm2	AWG	
		0.14	26	
		0.22	24	
		0.31	22	
			Crimp Tensil N(kgf) Min.	
			19.6(2.0)	
			29.4(3.0)	
			49.0(5.0)	
			58.8(6.0)	
3.5.7	Contact Retention Force	Housing Material 6/6 Nylon (UL94V-0) 14.7N (1.5kgf) Min	Apply an axial pull-off load to Crimped wire. Operation Speed:100mm/min.	
3.5.8	Contact Insertion Force	Housing Material 6/6 Nylon (UL94V-0) 5.88N (0.6kgf) Max. per contact	Measure the force required to insert contact into housing	
3.5.9	Connector Mating Force	Initial & After 30 Cycle 105.84 N (10.8 kgf) MAX	Operation Speed :100mm/min Measure the force required to mate connectors at initial and after 30 cycles. AMP Spec. 109-5206 Condition B Based on JIS C 5402 6.6 But operation speed and measurement timing shall be applicable to the above.	
3.5.10	Connector Unmating Force	Initial 10.62 N (1.08 kgf) Min After 30 Cycle 5.22 N (0.54 kgf) Min	Operation Speed : 100 mm/min Measure the force required to mate connectors at initial and after 30 cycles. AMP Spec. 109-5206 Condition B Based on JIS C 5402 6.6 But operation speed and measurement timing shall be applicable to the above.	
3.5.11	Durability (Repeated Mate/Unmating)	20m Ω Max (Final)	No. of Cycles: 30 cycle AMP Spec. 109-5213 Based on JIS C 5402 6.3 But No. of cycle shall be applicable to the above	
Para.	Test Items	Requirements	Procedures	
3.5.12	Vibration (Low Frequency)	No electrical discontinuity greater than 1 μsec. shall	Subject mated connectors to 10-55-10Hz traversed in 1	

		occur. 20 mΩ Max.(Final)	minute at 1.52mm amplitude 2 hours each of 3 mutually perpendicular planes. 100mA applied. Mounting : Fig.7 AMP Spec. 109-5201 Based on JIS C 5402 6.1
3..5.13	Physical Shock	No electrical discontinuity greater than 1 μ sec. Shall occur. Final 20 mΩ Max.	Accelerated Velocity : 490 m/s ² (50G) Waveform : Half sine curve Duration : 11 m sec. Velocity Change : 3.4 m/s Number of Drops : 3 drops each to normal and reversed directions of X.Y and Z axes, totally 18 drops. Mounting : Fig.. 7 AMP Spec. 109-5208 Condition A Based on JIS C 5402 6.2
3.5.14	Connector Locking Strength	24.5N (2.5 kgf) Min.	Measure connector locking strength. Operation Speed : 100 mm/min.
3.5.15	Contact Mating Force	5.88N (0.6 kgf) Max	Measured by gauge tab (Fig.8) Operation Speed : 100 mm/min. Measurement timing : Initial AMP Spec. 109-5206 Based on JIS C 5402 6.4 But operation speed measurement timing shall applicable to the above.
3.5.16	Contact Unmating Force	Initial 0.2N (20gf) Min. After 30 Cycle 0.1N (10gf) Min.	Measured by gauge tab (Fig.8) Operation Speed : 100 mm/min. Measurement timing : Initial and after 30 cycles. AMP Spec. 109-5206 Based on JIS C 5402 6.4 But operation speed and measurement timing shall be applicable to the 7above.
Para.	Test Items	Requirements	Procedures
3.5.17	Double Lock Plate Locking Force	14.7 N (1.5 kgf) Min	Measure Double Lock Plate Locking force

	(Secondary Lock)		Operation Speed: 100 mm/min
Environmental Requirements			
3.5.18	Thermal Shock	20 M Ω Max. (Final)	Mated connector -55 °C/30 min. 85 °C/30min. Making this a cycle, repeat 25 cycles. AMP Spec. 109-5103 Condition A Based on JIS C 5402 7.2
3.5.19	Humidity-Temperature Cycling	Insulation resistance(final) 500 M Ω Min. Termination resistance 20 m Ω Max. (Final)	Mated connector, 25~65 °C, 90~95% R.H. 10 cycles Cold shock -10 °C performed AMP Spec. 109-5106 Based on JIS C 5402 7.4
3.5.20	Salt Spray	20 m Ω Max. (Final)	Subject mated connector to 5% salt concentration for 48 hours: AMP Spec. 109-5101 Condition A Based on JIS C 5402 7.1
3.5.21	Industrial Gas (SO ₂)	20 m Ω Max.(Final)	SO ₂ Gas : 3 \pm 1 ppm, 95% R.H. 40 \pm 2 °C, 96 hours
3.5.22	Temperature Life (Heat Aging)	20 m Ω Max.(Final)	Mated connector 105 °C, Duration : 4 days AMP Spec. 109-5104-3 Condition A Based on JIS C 5402 7.8
3.5.23	Resistance to Ammonia	20 m Ω Max.(Final)	Mated Connector released to 3% ammonia solution 25ml / l desiccator for 7 hours
3.5.24	Resistance to Cold	20 m Ω Max.(Final)	Mated connector -30 °C \pm 3 °C, 96 hours AMP Spec. 109-5108-3 Condition D Based on JIS C 5402 7.9

Fig. 2 (End)

3.6. Product Qualification Test Sequence

Test Examination	Test Group																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	Test Sequence (a)																
Examination of Product	1, 3	1,4	1,3	1	1,3	1,4	1,7	1,7	1,5	1,4	1,4	1,4	1,4	1,5	1,4	1,3	1,5
Termination Resistance (Low Level)							2,4,6	2,6	2,4	2,5	2,5	2,5	2,5	2,4	2,5		2,4
Dielectric withstanding Voltage						3									7		
Insulation Resistance						2									6		
Temperature Rising					12												
Vibration (Low Frequency)							5										
Physical Shock							3										
Connector Mating Force								3									
Connector Unmating Force								4									
Connector Locking Strength			2														
Contact Insertion Force				2													
Contact Retention Force						5											
Double Lock Plate Locking Force																2	
Contact Mating Force		2															
Contact Unmating Force		3															
Crimp Tensile Strength	2																
Durability (Repeated Mate/Unmating)								5									
Humidity-Temperature Cycling															3		
Thermal Shock									3								
Salt Spray										3							
Industrial SO ₂ Gas												3					
Temperature Life (Heat Aging)											3						
Resistance to Cold												3					
Resistance to Ammonia													3				
Resistance to Cold																	3

Fig.3 (End.)

(a) Numbers indicate sequence in which the tests are performed.

4. Quality Assurance Provisions :

4.1 Test Conditions :

Unless Otherwise specified, all the tests shall be performed in any combination of the following test conditions.

Temperature	15 ~ 35 °C
Relative Humidity	45 ~ 75 %
Atmospheric Pressure	86.6 ~ 106.6 Kpa

Fig. 4

4.2 Tests

4.2.1 Test Specimens :

The test specimens to be employed for the tests shall be conforming to the requirements Specified in the applicable product drawing. The crimped contacts shall be prepared in accordance with the requirements of applicable application Specification, 114-5203 Crimping of 2.5 mm Signal DBL-Lock Contacts on the wires specified in Fig. 5

4.2.2 Applicable Wires

The wires to be used for crimping the samples for performance testing shall be conforming to the requirements specified in Fig. 5

Calculated Cross Sectional Area (mm ²)	AWG	Diameter of a Conductor (mm)	Number of Conductors	Insulation Outer Diameter(mm)
0.14	26	0.16	7	1.3
0.22	24	0.16	11	1.4
0.34	22	0.16	17	1.5
0.53	20	0.18	21	1.8

Fig. 5

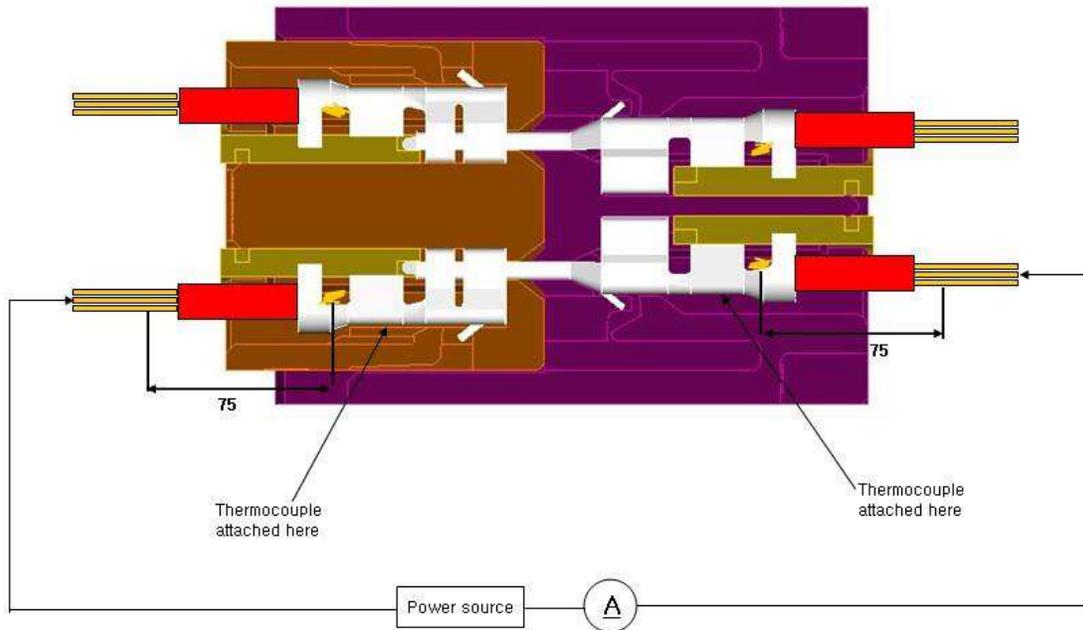


Fig. 6
Termination Resistance (Low Level) and Temperature Rising Vs Current Measuring Methods

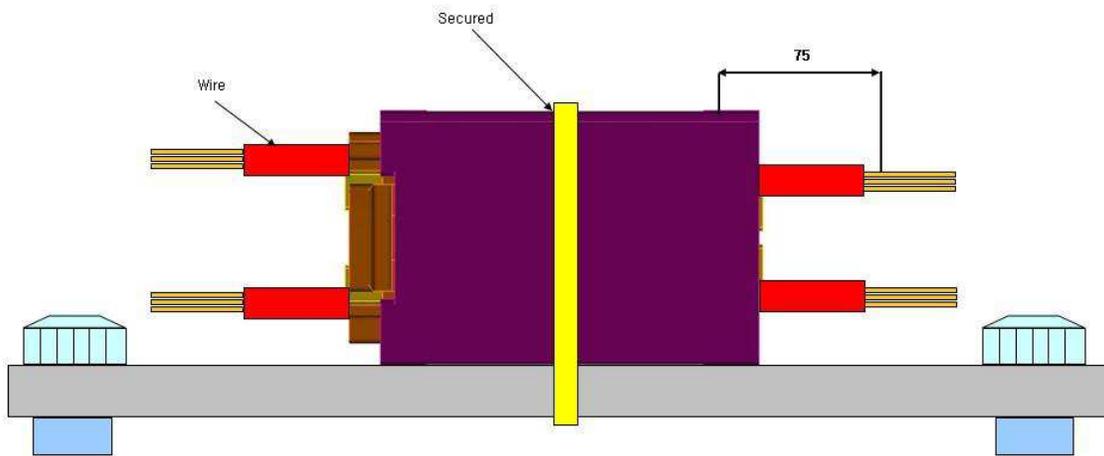


Fig. 7 Connector Mounting Methods of Low Frequency Vibration & Physical Shock Tests

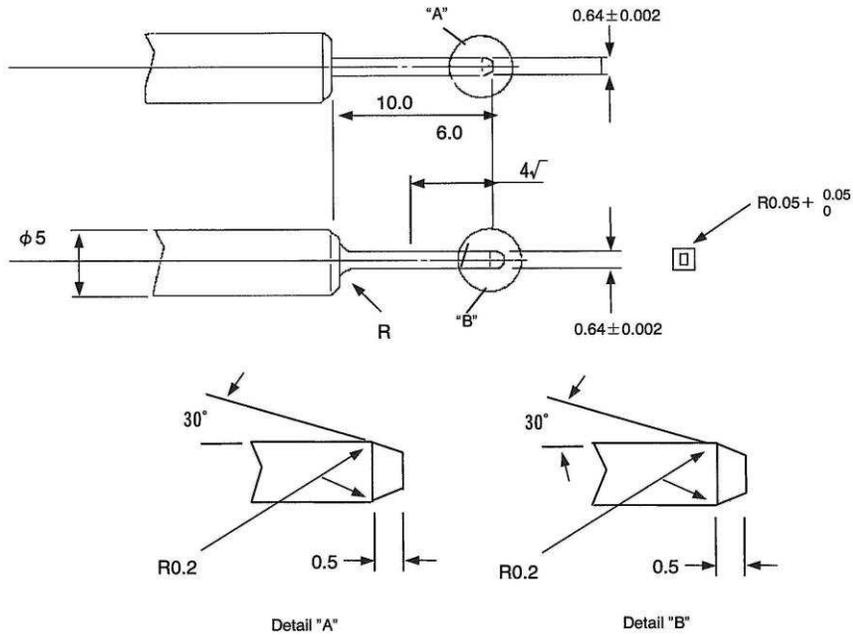


Fig. 8 Gage Design for Contact Mating/Unmating Force Tests