

108-5370

Design Objectives

.250 Series Double Lock Connector

NUMBER: 108-5370

Customer Release

SECURITY CLASSIFICATION:

1. Scope :

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of .250 Series Double Lock 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. 114-5052 Application Specifications
- C. 501- Test Report :
- D. IS-560 J Instruction Sheet .250 Series Double Lock Connector

2.2 Commercial Standard and Specifications :

- A. JASO D 605 Multi-Position Connector for Automobiles
- B. JIS C 3406 Low Voltage Cables for Automobiles
- C. JIS D 1601 Vibration Testing Method for Automobile Parts

				DR. 21 AUG 92	SHEET OF 1	 AMP (Japan), Ltd. Kawasaki, Japan			REV. 0	
				CHK. 21 AUG 92						10
				APP. 21 AUG '92	NAME .250 Series DBL. Lock Connector					
PRINT	0	RELEASED RFA-1875	T.S. RA	8/21 '92						
LTR		REVISION RECORD	DR	CHK	DATE					

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## 3. Requirements :

## 3.1 Design and Construction

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

## 3.2 Materials :

## A. Contact

a. Tab Contact : Brass

b. Receptacle Contact : Brass

## B. Housing

a. Plug Housing : 66 Nylon

b. Cap Housing : 66 Nylon

c. Double Lock Plate : PBT

## C. Others :

## 3.3 Ratings :

A. Temperature Rating : - 40 °C to 120 °C

## 3.4 Performance 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.

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## 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 (Specified Current)	Wire Size mm <sup>2</sup> (AWG)	Test (A) Current	Resistance mV/A (Max.)	Measure initial millivolt drop of contact test circuit in mated connectors, Fig. 3. AMP Spec. 109-5311-2
		0.3 (#22)	2	6	
		0.5 (#20)	4	12	
		0.85 (#18)	7	21	
		1.25 (#16)	10	30	
		2.0 (#14)	15	45	
3.0 (#12)	20	60			
3.5.3	Termination Resistance (Low Level)	3 mΩ Max. (Initial) 10 mΩ Max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10 mA Max. at open circuit voltage of 20 mV Max. Fig. 3 AMP Spec. 109-5311-1		
3.5.4	Dielectric Strength	No creeping discharge nor flashover shall occur.	1 kVAC for 1 minute. Test between adjacent circuits of mated connectors. AMP Spec. 109-5301		
3.5.5	Insulation Resistance	100 MΩ Min. (Initial) 100 MΩ Min. (Final)	Impressed voltage 500 V DC. Test between adjacent circuits of mated connectors. AMP Spec. 109-5302		
3.5.6	Temperature Rising	Wire range 0.3~0.85 20 °C Max. Wire range 1.25~3 30 °C Max. Under loaded specified current.	Measure temperature rising by energized current. AMP Spec. 109-5310 Method Only one set contacts		

Fig. 1 (CONT)

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Para.	Test Items	Requirements	Procedures	
Physical Requirements				
3.5.7	Vibration (Frequency)	10 mΩ Max. (Final)	Subject mated connectors to the vibration testing of the following conditions: Frequency : 33 Hz Accelerated Velocity : 44 m / s <sup>2</sup> (4.5 G) Direction : Along Contact Axis and Perpendicular to Contact Axis Duration : 200 Hours totally, Change direction at every 50 hours of test duration.	
3.5.8	Contact Retention Force (Secondary Lock)	98 N (10 kgf) Min.	Measure contact retention force with secondary lock set in effect. Operation Speed : 100 mm / min.	
3.5.9	Crimp Tensile Strength	Wire Size	Apply an axial pull-off load to crimped wire of contact secured on the tester, Operation Speed : 100 mm / min. AMP Spec. 109-5205 Condition	
		mm <sup>2</sup> (AWG)		Crimp Tensile (min.)
		0.3 (#22)		N (kgf)
		0.5 (#20)		5.9 (6)
		0.85 (#18)		88.3 (9)
		1.25 (#16)		127.5 (13)
2.0 (#14)	176.6 (18)			
3.0 (#12)	264.9 (27)			
3.0 (#12)	294.3 (30)			
3.5.10	Connector Mating Force	Type	Operation Speed : 100 mm / min. Measure the force required to mate connectors. AMP Spec. 109-5206 Condition : 100 mm / min.	
		Pos.		Mating Force (Max.)
				N   kgf
		Standard		1   39   4
		Standard		4   74   7.5
		Standard		6   98   10
		Inter Lock		1   44   4.5
		Inter Lock		3   67   6.8
		Inter Lock		4   78   8
		Inter Lock		5   88   9
		Inter Lock		7   110   11.2
Inter Lock	9   132   13.5			
Panel Mount	2   49   5			
Panel Mount	3   63   6.4			

Fig. 2 (CONT)

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Para.	Test Items	Requirements				Procedures
3.5.11	Connector Unmating Force	Type	Pos.	Unmating Force (Min.)		Operation Speed : 100 mm / min. Measure the force required to unmate connectors. AMP Spec. 109-5206 Condition :
		Standard	1	4.9	0.5	
		Standard	4	29.4	3	
		Standard	6	44.1	4.5	
		Inter Lock	1	4.9	0.5	
		Inter Lock	3	19.6	2	
		Inter Lock	4	29.4	3	
		Inter Lock	5	39.2	4	
		Inter Lock	7	49	5	
		Inter Lock	9	68.6	6	
		Panel Mount	2	9.8	1	
		Panel Mount	3	19.6	2	
3.5.12	Connector Locking Strength	98 N (10 kgf) Min.				Measure connector locking strength. Operation Speed : 100 mm / min. AMP Spec. 109-5210
3.5.13	Contact Insertion Force	19.6 N (2 kgf) Max. per contact.				Measure the force required to insert contact into housing. AMP Spec. 109-5211
3.5.14	Contact Retention Force	78.5 N (8 kgf) Min.				Apply an axial pull-off load to crimped wire. Operation Speed : 100 mm / min. AMP Spec. 109-5212
3.5.15	Humidity, Steady State	Dielectric strength no trouble. Insertion resistance (Final) 100 MΩ Min. Termination resistance (Final) 10 mΩ Max.				Mated Connector, 90~95 % R.H. 60 ± 5 °C, 96 hours AMP Spec. 109-5105

Fig. 2 (CONT)

SHEET 5 OF 10	<b>AMP</b>		AMP (Japan), Ltd. Kawasaki, Japan	
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Para.	Test Items	Requirements			Procedures
3.5.16	Temperature Life (Heat Aging)	10 mΩ Max. (Final)			Subject mated connectors to exposure of 120 °C ± 3 °C for 120 hours. AMP Spec. 109-5104 Condition
3.5.17	Resistance to Cold	10 mΩ Max. (Final)			Subject mated connectors to exposure of - 50 °C ± 5 °C for 120 hours. AMP Spec. 109-5108 Condition
3.5.18	Removal Froce of Plate from Lock Position to Pre-Lock Position	4.9 N (0.5 kgf) Min. 1 Pos. 9.8 N (1 kgf) Min. 2~9 Pos.			Operation Speed : 100 mm / min. Apply an axial Pull-off load.
3.5.19	Removal Froce of Plate from Housing	9.8 N (1 kgf) Min. 1 Pos. 19.6 N (2 kgf) Min. 2~9 Pos.			Operation Speed : 100 mm / min. Apply an axial Pull-off load.
3.5.20	Insertion Force of Plate from Pre-Lock Position	Type	Pos.	Insertion Force s of Plate from Pre-Lock Position N (kgf)	Operation Speed : 100 mm / min. Apply an axial Push-on load.
		Standard	1 pos.	9.8~19.6(1~2)	
		Standard	4 Pos.	14.7~34.3(1.5~3.5)	
		Standard	6 Pos.	14.7~44.1(1.5~4.5)	
		Inter Lock	1 Pos.	9.8~19.6(1~2)	
		Inter Lock	3 Pos.	14.7~29.4(1.5~3)	
		Inter Lock	4 Pos.	14.7~29.4(1.5~3)	
		Inter Lock	5 Pos.	14.7~29.4(1.5~3)	
		Inter Lock	7 Pos.	14.7~29.4(1.5~3)	
		Inter Lock	9 Pos.	14.7~53.9(1.5~5.5)	
		Horn	1 Pos.	9.8~19.6(1~2)	
		Standard Cap	4 Pos.	14.7~44.1(1.5~4.5)	
		Standard Cap	6 Pos.	14.7~44.1(1.5~4.5)	
		Inter Lock	3 Pos.	14.7~44.1(1.5~4.5)	
		Inter Lock	4 Pos.	14.7~29.4(1.5~3)	
		Inter Lock	5 Pos.	14.7~34.3(1.5~3.5)	
Inter Lock	9 Pos.	14.7~34.3(1.5~3.5)			
Panel Mount	2 Pos.	4.9~19.8(0.5~2)			
Panel Mount	3 Pos.	4.9~44.1(0.5~4.5)			

Fig. 2 (CONT)

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Para.	Test Items	Requirements	Procedures
3.5.21	Contact Mating Force	7.8~29.4 N (0.8~3 kgf)	Operation Speed : 100 mm / min. Measure the force required to mate contacts. AMP Spec. 109-5206
3.5.22	Contact Unmating Force	7.8~29.4 N (0.8~3 kgf)	Operation Speed : 100 mm / min. Measure the force required to unmate contacts. AMP Spec. 109-5206

Fig. 2 (End)

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## 3.6 Product Qualification and Tests Sequence.

Test or Examination	Test Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Test Sequence													
Confirmation of Product	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Termination Resistance (Current)	2													
Termination Resistance (Low Level)							2, 4	2, 4	2, 4	2, 4				
Dielectric Strength		3						6						
Insulation Resistance		2						5						
Temperature Rising	3													
Vibration (Low Frequency)							3							
Connector Mating Force				2										
Connector Unmating Force				3										
Connector Locking Strength		4												
Contact Insertion Force					2									
Contact Retention Force					3									
Contact Retention Force (Secondary Lock)						2								
Contact Mating Force														2
Contact Unmating Force														3
Crimp Tensile Strength			2											
Humidity (Steady State)								3						
Temperature Life (Heat Aging)									3					
Resistance to Cold										3				
Removal Force of Plate from Lock Position to Pre-lock Position											2			
Removal Force of Plate from Housing												2		
Insertion Force of Plate from Pre-lock Position													2	

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

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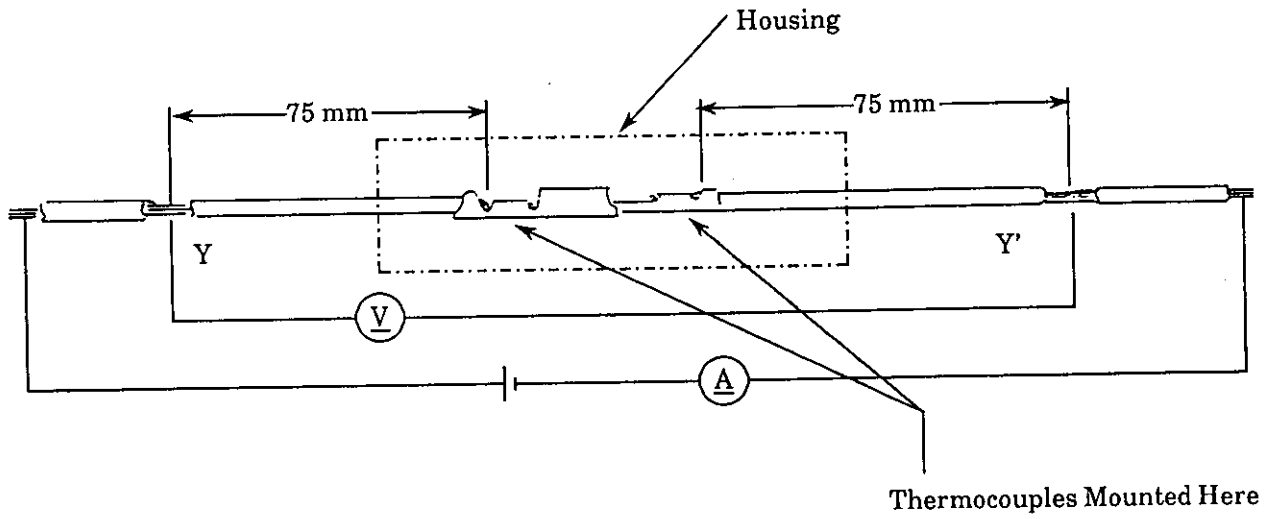


Fig. 3

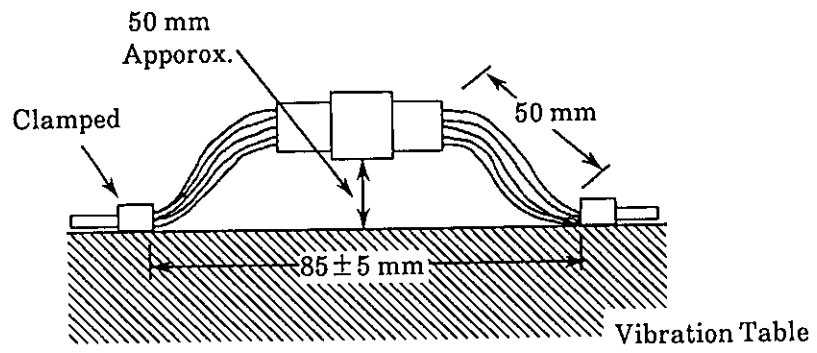


Fig. 4

SHEET	<b>AMP</b>		AMP (Japan), Ltd.	
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The applicable product descriptions and parts numbers are as shown in Appendix 1.

付表 1

Prod. P/N	Description
176986	1 Pos. Plug Ass'y Standard Type
178004	4 Pos. Plug Ass'y Standard Type
178022	6 Pos. Plug Ass'y Standard Type
178007	4 Pos. Cap Ass'y Standard Type
178025	6 Pos. Cap Ass'y Standard Type
176989	1 Pos. Plug Ass'y Inter Lock Type
176995	3 Pos. Plug Ass'y Inter Lock Type
178010	4 Pos. Plug Ass'y Inter Lock Type
178016	5 Pos. Plug Ass'y Inter Lock Type
178028	7 Pos. Plug Ass'y Inter Lock Type
178031	9 Pos. Plug Ass'y Inter Lock Type
176998	3 Pos. Cap Ass'y Inter Lock Type
178013	4 Pos. Cap Ass'y Inter Lock Type
178019	5 Pos. Cap Ass'y Inter Lock Type
178034	9 Pos. Cap Ass'y Inter Lock Type
176992	2 Pos. Cap Ass'y Panel Mount Type
178001	3 Pos. Cap Ass'y Panel Mount Type
178471	1 Pos. Plug Ass'y Horn Type

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