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Power Double Lock Connector (Glow Wire)

1. Scope:

1.1. Contents

This design objective is extended from 108-5410 to cover the requirements for product performance, test methods and quality assurance provisions of Power Double Lock Connector (Glow Wire). Therefore unless otherwise specified, please refer to the 108-5410.

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

2. Applicable Documents:

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

2.1. Tyco Electronics Specification:

- A. 109-5000 Test Specification, General Requirements for test Methods
- B. 114-5175 Application Specification

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. Housing: 3.96 mm Pitch Plug HSG & Cap HSG, 6.5 mm Pitch Plug HSG
6/6 Nylon (UL94 V-0, GWIT 775°C and GWFI 850°C), Tracking Index: 250V
- B. Others: Refer to the 108-5410

3.3. Ratings:

- A. Voltage Rating: 300 V AC (3.96mm Pitch W-W, 6.5mm Pitch W-B)
50 V AC (3.96mm Pitch W-B)
- B. Current Rating: See Fig. 1
- C. Temperature Rating: -30°C to 65°C (Include temperature rising by energized current)
- D. Minimum Rating: 1mV, 1μA Min.
- E. Applicable P.C.B Thickness: 1.6mm
 - Diameter of the hole for Tine: 1.25±0.05mm (Punched hole)
1.4±0.05mm (Drilled hole)
 - Diameter of the hole for Boss: 2.2±0.05mm (Punched hole & Drilled hole)

(Unit: A)

Contact Position	Rec. Contact: 177915-□ Tab Contact: 177917-1			Rec. Contact: 177914-□ Tab Contact: 177916-1		
	Wire Size AWG #16	AWG #18	AWG #20	AWG #22	AWG #24	AWG #26
1 · 2	10	8	7	5	4	3
3	9	7	6	4	3	2
4	9	7	6	4	3	2
6	8	6	5	3	2	2
8	8	6	5	3	2	2
9	8	6	5	3	2	2
10	7	5	4	2	2	2
12	7	5	4	2	2	2

Fig. 1

3.4. Performance Requirements and Test Descriptions:

The Product shall be designed to meet the electrical, mechanical and environment performance requirements specified in Fig.3. All tests shall be performed in the room temperature unless otherwise specified.

3.5 Test Requirements and Procedures Summary

No.	Test Items	Requirements	Procedures
3.5.1	Examination of Product	Meets requirements of product drawing and AMP Specification (114-5175). After test, no corrosion influence performance	Visual inspection No Physical damage
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	10 mΩ min. (Initial) 20 m Ω min. (Final)	Subject mated contacts assembled in housing to 20mV Max and open circuit at 10mA. Take the resistance of the wire only away from measurement. Fig. 8. AMP Spec.109-5311-1
3.5.3	Insulation Resistance	1000 MΩ min. (Initial) 500 M Ω min. (Final)	Impressed voltage 500VDC. Test between adjacent circuits and between the surface of housing and contact of mated connectors. AMP Spec. 109-5302
3.5.4	Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur. Current leakage: 5mA Max.	2.2 KV AC for 1 minute. Test between adjacent circuits and between the surface of housing and contact of mated connectors.

Fig. 2 (To be continued)

No.	Test Items	Requirements	Procedures
Mechanical Requirements			
3.5.5	Contact Insertion Force	0.7 kgf Max.	Measure the force required to insert contact into housing. AMP Spec. 109-5211
3.5.6	Contact Retention Force	Without Double lock plate	2.5 kgf Min. Apply an axial pull-off load to crimped wire. Use the wire of AWG #16 or AWG #18 Operation Speed: 100 mm/Min. AMP Spec. 109-5210
		With Double lock plate	
3.5.7	HSG Locking Strength	3.5kgf Min.	Measure connector locking strength. Operation Speed: 100mm/Min. AMP Spec.109-5210
3.5.8	Connector Mating/ Unmating Force	Mode	High-Pressure Type
		Mating Force	(0.7X Pos.) kgf Max.
		Un-mating Force	(0.15X Pos.) kgf Min.
3.5.9	Durability	Mode	High-Pressure Type
		Mating Force	(0.7X Pos.) kgf Max.
		Un-mating Force	(0.1X Pos.) kgf Min.
Environmental Requirements			
3.5.10	Thermal Shock	20 mΩ Max. (Final)	Mated connector -55°C/30 min., 85°C/30 min. Making this a cycle, repeat 25 cycles. AMP Spec. 109-5103 Condition A The measurement is held after being left indoor for 3 hours.
3.5.11	Heat Aging	20 mΩ Max. (Final)	Mated Conn. 105± 2°C Duration:96 hr AMP Spec. 109-5104-3 Condition A The measurement is held after being left indoor for 3 hours.
3.5.12	Resistance to cold	20 mΩ Max. (Final)	Mated connector -30°C± 2°C, 96 hours AMP Spec. 109-5108-3 Condition D
3.5.13	Humidity Temperature Cycling	Dielectric withstanding voltage 2.2KV AC 1minute. Insulation Resistance (Final) 500MΩ Min. Termination resistance (Final) 20mΩ Max.	Mated connector, 25~65°C, 80~98%R.H.10cycles Cold shock -10°C(not) performed AMP Spec. 109-5106 The measurement is held after being left indoor for 3hours

Fig. 2 (End)

※ Product must be without rust, corrosion transformation, crack and discoloration.

3.6 Product Qualification Test Sequence

Test or Examination	Test Group							
	1	2	3	4	5	6	7	8
	Test Sequence (a)							
Examination of Product	1,4	1,4	1,4	1,4	1	1	1	1
Termination Resistance (Low Level)	2,5	2,5	2,5	2,5				4
Insulation Resistance				6				
Dielectric withstanding Voltage				7				
Contact Insertion Force					2			
Contact Retention Force						2		
HSG Locking Strength							2	
Connector Mating/ Unmating Force								2
Durability								3
Thermal Shock	3							
Heat Aging		3						
Resistance to cold			3					
Humidity Temperature Cycling				3				

Fig. 3

(a) Numbers indicate the 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 drawings. The crimped contacts shall be prepared in accordance with the requirements of applicable application specification, 114-5175, Crimping of AMP Power Double Lock Contacts on the wires specified in Fig. 5 of this specification.

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	1.30
0.22	24	0.16	11	1.5
0.31	22	0.18	12	2.0
0.51	20	0.18	20	2.6
0.76	18	0.18	30	2.8
1.27	16	0.18	50	3.1

Fig. 5

Pos. number	Name	Remarks	
□-177915-□	Receptacle Contact	AWG #20~#16	-1: Normal Type -2: High Pressure Type
□-177914-□		AWG #26~#22	
□-177917-□	Tab Contact	AWG #20~#16	
□-177916-□		AWG #26~#22	
See Fig. 6	Plug Housing	3.96 mm Pitch	2,3,4,6,8,9,12 Pos.
See Fig. 8		6.5 mm Pitch	3,4,6 Pos.
See Fig. 6	Cap Housing	3.96 mm Pitch	2,3,4,6,8 Pos
See Fig. 12, 17 in 108-5410	Double Lock Plate	3.96 mm Pitch	2,3,4,6,8,9,12 Pos.

Appendix 1

3.96mm Pitch

Pos.	Desc.	Plug Housing	Cap Housing		Remarks	
			Free-Hanging Type	Panel Mount Type		
1		□-2005246-□	□-1971611-□	□-1971611-□	1	Single Row Type
2		□-2005247-□	□-2005248-□	□-2005249-□		
3		□-368571-□	□-368572-□	□-2005250-□		
4		□-2005251-□	□-1971599-□	□-1971599-□		
4		□-368575-□	□-368587-□	□-368589-□	2	Double Row Type
6		□-368576-□	□-2005253-□	□-368588-□		
8		□-1971598-□	□-1971600-□	□-1971600-□		
9		□-2005254-□	□-2005254-□	□-2005254-□	3	Triple Row Type
12		□-2005255-□	□-2005255-□	□-2005255-□		

Fig. 6

6.5mm Pitch

Pos.	Desc.	Header Assembly	Plug Housing	Remarks	
3		□-368570-□	□-368570-□	1	Single Row Type
4		□-368574-□	□-368574-□	2	Double Row Type
6		□-2005252-□	□-2005252-□		

Fig. 7