

Product Specification
108-60042
AMP Connector
FH Connector Lead Free Version

1. Scope:

1.1 Contents:

This specification covers the requirements for product performance, test methods and quality assurance provisions of AMP FH Connector.

Applicable product descriptions and part number 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 Specification:

- A. 109-5000 Test Specification, General Requirements for Test Methods
- B. 501-60012 Test Report: (Dip Type)
- 501-60013 Test Report: (SMT Type)
- 501-60014 Test Report: (Plug 13 mm stacking)

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			S. YAO					
			I. ENOMOTO		NO	108-60042	REV O	LOC ES
			PAGE 1 of 7	TITLE AMP Connector, FH Connector Lead Free Version				
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LTR	REVISION RECORD	DR	DATE					

3. Requirements:

3.1 Design and Construction:

Product shall be to the design, construction and physical dimension specified in the applicable product drawing.

3.2 Materials:

A. Contact: Phosphor Bronze

0.3 μm minimum thick gold-plated on contact area only, and 1.0 μm minimum thick matte tin plated on tine area only, over 1.3 μm minimum thick nickel under plated all over.

B. Housing: DIP Type: Glass Fiber Reinforced 6/6 NYLON Compound,

Colour: Black, UL 94 V-0 Rated

SMT Type: Heat Resistance Type Polymer, Compound,

Colour: Black, UL 94 V-0 Rated

DIP Heat Resistance Type: Glass Fiber Reinforced PA6T Compound

Colour: Black, UL 94 V-0 Rated

C. Others: Retention Leg: Brass

1.0 μm minimum thick matte tin plated all over, over

1.0 μm minimum thick nickel underplate

3.3 Ratings:

A. Voltage Rating: 250VAC

B. Current Rating: 1A

C. Temperature Rating: -55°C to $+85^{\circ}\text{C}$

-55°C to $+105^{\circ}\text{C}$ (Heat Resistance Type)


3.4 Performance and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig. 1. All tests are 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 inspection plan.
Electrical Requirements			
3.5.2	Termination Resistance (Low Level)	35 mΩ Max. (Initial) ΔR=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. 2 AMP Spec. 109-5311-1
3.5.3	Dielectric Strength	Neither creeping discharge nor flashover shall occur. Current leakage: 0.5 mA Max.	0.5 k VAC for 1 minute. Test between adjacent circuits of mated connectors. AMP Spec. 109-5301
3.5.4	Insulation Resistance	1,000 MΩ min. (Initial) 100 MΩ min. (Final)	Impressed voltage 500 V DC. Test between adjacent circuits of mated connectors. AMP Spec. 109-5302
3.5.5	Temperature Rising	30°C Max. , under loaded specified current.	Measure temperature rising by energized current. Fig. 2 AMP Spec. 109-5310-1

Fig. 1 (to be continued)

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Para.	Test Items	Requirements	Procedures
3.5.6	Mating Force	<p>Detent Lock Not Inclusive Per Contact: 0.69 N. (0.07 kgf) Max.</p> <p>Detent Lock Inclusive 40 Pos: 58.8 N (6 kgf) Max. 60 Pos: 58.8 N (6 kgf) Max. 80 Pos: 58.8 N (6 kgf) Max. 100 Pos: 78.4 N (8 kgf)Max. 120 Pos: 88.2 N (9 kgf)Max. 140 Pos: 98.0 N (10 kgf) Max. 160 Pos: 117.6 N (12 kgf) Max. 180 Pos: 127.4 N (13 kgf) Max.</p>	<p>Operation Speed: 100 mm/min</p> <p>Measure the force required to mate connectors.</p> <p>AMP Spec. 109-5206</p> <p>Condition B</p>
3.5.7	Unmating Force	<p>Detent Lock Not Inclusive Per Contact: 0.147 N (0.015 kgf) Min.</p> <p>Detent Lock Inclusive 40 Pos: 15.68 N (1.6 kgf) Min. 60 Pos: 18.62 N (1.9 kgf) Min. 80 Pos: 21.56 N (2.2 kgf) Min 100 Pos: 24.5 N (2.5 kgf) Min. 120 Pos: 27.44 N (2.8 kgf) Min. 140 Pos: 30.38 N (3.1 kgf) Min. 160 Pos: 33.32 N (3.4 kgf) Min. 180 Pos: 36.26 N (3.7 kgf) Min.</p>	<p>Operation Speed: 100mm/min.</p> <p>Measure the force required to mate connectors.</p> <p>AMP Spec. 109-5206</p> <p>Condition B</p>
3.5.8	Vibration (Low Frequency)	No electrical discontinuity greater than 1 μ sec. Shall occur.	<p>Subject mated connectors to 10-55-10 Hz traversed in 1 minute at 1.52 mm amplitude 2 hours each of 3 mutually perpendicular planes. 100 mA applied.</p> <p>AMP Spec. 109-5201</p>

Fig.1 (to be continued)

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Para.	Test Items	Requirements	Procedures
3.5.9	Physical Shock	No electrical discontinuity greater than 1 μ sec. Shall occur	Accelerated Velocity: 490 m/s ² (50 G) Waveform : half sine Duration : 11 m sec. Number of Drops: X, Y, Z, Axis each 6 Drops, Totally 18 Drops AMP Spec. 109-5208 Condition A
3.5.10	Durability	$\Delta R=10$ m Ω Max. (Final)	Operation Speed: 100 mm/min. No. of Cycles: 2000 cycles. AMP Spec. 109-5213
3.5.11	Solderability (Dip Type) (SMT Type)	Wet Solder Coverage: 95% Min. Soldering area must appear with normally working fillet of solder.	Solder Temperature: 235 \pm 5 $^{\circ}$ C Immersion Duration : 5 \pm 0.5 seconds Flux: Alpha 100 AMP Spec. 109-5203 Test in the following test condition: Preheat 150~180 $^{\circ}$ C 90 \pm 30 sec Heating 230 $^{\circ}$ C min. 30 \pm 10 sec. Peek Temperature: 255 $^{\circ}$ C max. (Measured at housing surface)
Environmental Requirements			
3.5.12	Resistance to Soldering Heat (Dip Type)	No physical damage shall occur.	(DIP Type) Test connector on PCB. Solder Temperature: 260 \pm 5 $^{\circ}$ C Immersion Duration: 10 \pm 1 sec. AMP Spec. 109-5204 Condition B
3.5.13	Resistance to Soldering Heat Reflow	No physical damage shall be evident.	Test by mounting on PCB. Preheat 150~180 $^{\circ}$ C 90 \pm 30 sec Heating 230 $^{\circ}$ C min. 30 \pm 10 sec. Peek Temperature: 255 $^{\circ}$ C max. (Measured at housing surface)

Fig. 1 (to be continued)

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Para.	Test Items	Requirements	Procedures
3.5.14	Thermal Shock	$\Delta R=10\text{ m}\Omega$ Max. (Final)	-55°C/30 min. 85°C/30 min. Making this a cycle. Repeat 5 cycles AMP Spec. 109-5103 Condition B
3.5.15	Humidity-Temperature Cycling	Insulation resistance 100 M Ω Min Termination resistance $\Delta R=10\text{ m}\Omega$ Max (Final)	Mated Connector. 25~65°C, 95% R. H. 10 cycle AMP Spec. 109-5106
3.5.16	Salt Spray	$\Delta R=10\text{ m}\Omega$ Max (Final)	Subject mated connectors to 5% salt concentration for 48 hours: AMP Spec. 109-5101 Condition A
3.5.17	Industrial Gas (SO ₂)	$\Delta R=10\text{ m}\Omega$ Max (Final)	SO ₂ Gas: 10 ppm, 95% R. H. 25°C, 48 hours AMP Spec. 109-5107 Condition B
3.5.18	Temperature Life (Heat Aging)	$\Delta R=10\text{ m}\Omega$ Max (Final)	85°C, Duration: 250 hours 105°C, Duration: 250 hours (Heat Resistance Type) AMP Spec. 109-5104-2 Condition C

Fig. 1 (end)

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3.6 Product Qualification Test Sequence:

Test or Examination	Test Group										
	1	(c) 2	3	4	5	6	(b) 7	8	(c) 9	(c)10	11
	Test Sequence (a)										
Examination of Product	1,7	1,5	1,5	1,5	1,5	1,5	1,6	1,7	1	1,3	1,3
Termination Resistance (Low Level)	4,6	2,4	2,4	2,4	2,4	2,4	2,5				
Dielectric Strength								3,6			
Insulation Resistance								2,5			
Temperature Rising									2		
Vibration (Low Frequency)							3				
Physical Shock							4				
Mating Force	2										
Unmating Force	3										
Durability	5										
Solderability											2
Resistance to Soldering Heat										2	
Thermal Shock			3								
Humidity-Temperature Cycling		3						4			
Salt Spray						3					
Industrial Gas (SO2)					3						
Temperature Life (Heat Aging)				3							

(a) Numbers indicate sequence which tests are performed.

(b) Discontinuities shall not take place in this test group, during tests.

(c) Evaluation Group for SMT Type.

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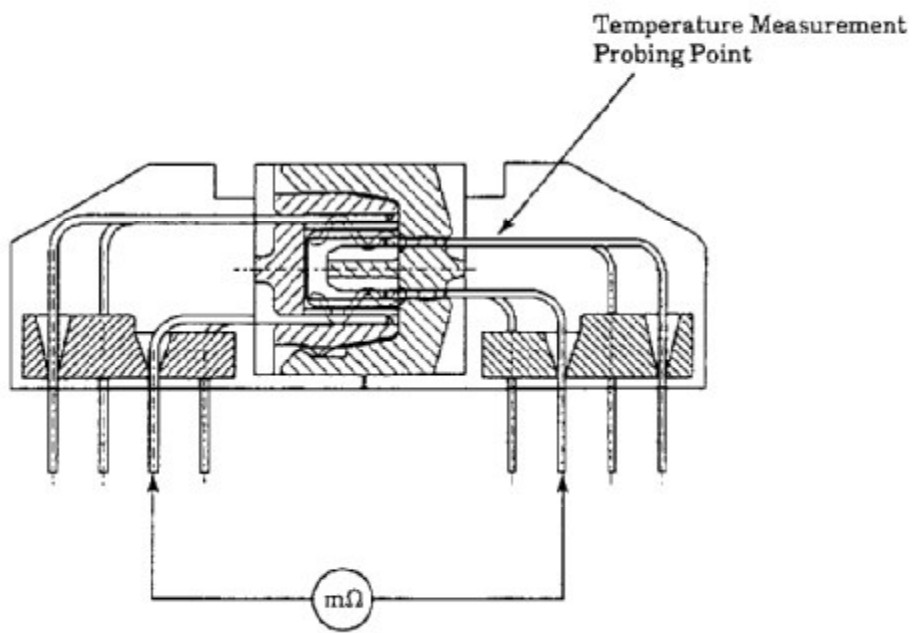
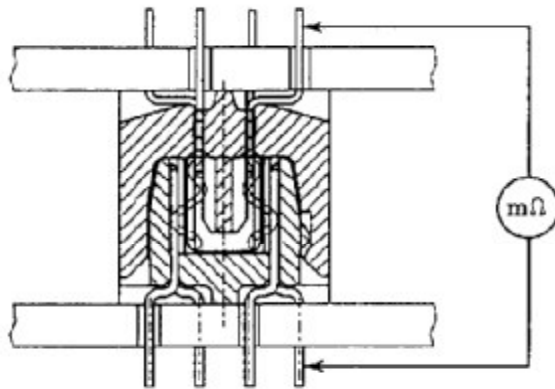


Fig. 2

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

Appendix 1

Prod. P/N	Descriptions
5176381	Plug Connector (Right Angle) w/Leg
5917653	Plug Connector (Right Angle) w/Leg w/Anti Flux Migration Agent
5179006	Plug connector (Vertical SMT) 100p W12
5917815	Plug connector (Vertical SMT) 60p 13mm stack
5179656	Plug connector (Vertical SMT) 60p W9.5w/Peg
5917094	Plug connector (Vertical) High Temp. & High Dura.
5179540	Plug connector (Vertical) High Temp. Type
5917631	Plug connector (Vertical) w/Anti Flux Migration Agent
5176379	Receptacle Connector (Right Angle) w/Leg
5179530	Receptacle connector (Vertical) H10 High Temp. Type
5917630	Receptacle connector (Vertical) H10 w/Anti Flux Migration Agent
5176371	Receptacle connector (Vertical) H11
5176372	Receptacle connector (Vertical) H12
5176373	Receptacle connector (Vertical) H13
5179533	Receptacle connector (Vertical) H13 High Temp. Type
5176374	Receptacle connector (Vertical) H14
5176375	Receptacle Connector (Vertical) H15
5176376	Receptacle Connector (Vertical) H16
5176377	Receptacle Connector (Vertical) H17
5176378	Receptacle Connector (Vertical) H18
5179528	Receptacle Connector (Vertical) H8 High Temp. Type
5917628	Receptacle Connector (Vertical) H8 w/Anti Flux Migration Agent
5177980	Receptacle Connector (Vertical) H8 Tine 1.8
5917629	Receptacle Connector (Vertical) H9 w/Anti Flux Migration Agent