Micro Motor Connector Plus (Screw Mount)

1. Scope

1.1. Content

This design objective is extended from 108-5864 to cover the requirements for product performance, test methods and quality assurance provisions of Micro Motor Connector Plus. Therefore unless otherwise specified, please refer to 108-5864.

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

1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used.

All inspections shall be performed using the applicable inspection plan and product drawing.

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. Tyco Electronics Specification

A. 109-5000 : Test Specification, General Requirements for Test Method

B. 114-5335, 114-5446 : Application Specification for Rec & Post Contact

C. 411-61019 : Instruction Sheet

D. 501-61139 : Qualification Test Report

2.2. Commercial Standard

A. MIL-STD-202 : Test Methods for Electronic and Electrical Component 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: Materials used in the construction of this product shall be as specified on the applicable drawings as shown in Appendix 1.

3.3. Ratings:

A. Voltage Rating : 10 VAC rms

B. Current Rating : 1.0A(8 Pos)+ Ground

C. Temperature Rating : -30°C to 105°C (Including temperature rising)

D. Degrees of Protection : IP67

3.4. Applicable Wire

- Finished Diameter : Ø 6.8~ 7.4mm
- Wire Size : 0.13~0.33mm^2
- Wire Insulation : Ø 1.2mm Max.

3.5. Performance Requirements and Test Descriptions:

The Product shall be designed to meet the electrical, mechanical and environment performance requirements specified in Fig.1. All tests shall be performed in the room temperature unless otherwise specified.

3.6. Test Requirements and Procedures Summary

No.	Test Description	Requirement	Procedure
3.6.1	Examination of Product	Meets requirements of Product drawing and the specification.	Visual Inspection No physical damage
Electrical Requirements			
3.6.2	Termination Resistance (Low Level)	10 mΩ Max. (Initial) 500 mΩ Max.(Ground Initial)	Subject mated contacts assembled in housing to closed circuit current of 10mA Max. at open circuit voltage of 20mV Max. as shown Fig.3. AMP Spec.109-5311-1
3.6.3	Insulation Resistance	500 MΩ Min.	Impressed voltage 500V DC for 1 minute between adjacent circuits of mated connector. AMP Spec. 109-5302-4
3.6.4	Dielectric Withstanding Voltage	No creeping discharge nor flashover shall be occurred. Current leakage: 5mA Max.	Apply 500V AC for 1 minute between adjacent contacts of mated connector. AMP Spec. 109-5301
3.6.5	Temperature Rising	30°C Max. under loaded rating current.	Measure temperature rising by energized current as shown Fig.4 AMP Spec. 109-5310-2

Fig. 1 (Continue)

Mechanical Requirements			
3.6.6	Post Contact Insertion Force	4.9 N (0.5kgf) Max. per contact	Measure the force required to insert contact into housing. Operation Speed : 25mm/min.
3.6.7	Post Contact Retention Force	7.84 N (0.8kgf) Min. per contact	Apply an axial pull-off load to crimped wire. Operation Speed : 25mm/min.
3.6.8	Connector Mating Force	Initial : 29.4 N (3.0 kgf) Max.	Measure the force required to mate connectors. Operation Speed :25 mm/min. AMP Spec. 109-5206
3.6.9	Connector Un-mating Force	Initial : 3.92 N(0.4 kgf) Min.	Measure the force required to un-mate connectors. Operation Speed : 25 mm/min. AMP Spec. 109-5206
3.6.10	Durability (Repeated Mating /Un-mating)	⊿R=20 mΩ Max. (Final) ⊿R=500 mΩ Max.(GRND Final)	No. of Cycles : 100 cycles. Screws are to be removed. AMP Spec. 109-5213
3.6.11	Vibration	No electrical discontinuity greater than 1μsec Max. shall occur. ⊿R=20 mΩ Max. (Final) ⊿R=500 mΩ Max. (GRND Final)	Subject mated connectors to 10-500-10Hz traversed in 15 minute at 1.5 mm amplitude 3 hours each of 3 mutually perpendicular planes. 4.3V or less voltage continues for 1 μsec or more in gauge by applying 100mA, 5V open voltage. AMP Spec. 109-5202 Condition A
3.6.12	Physical Shock	No electrical discontinuity greater than 1μsec Max. shall occur. ⊿R=20 mΩ Max. (Final) ⊿R=500 mΩ Max. (GRND Final)	Accelerated Velocity :490 m/s^2 (50 G) 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. 4.3V or less voltage continues for 1 μsec or more in gauge by applying 100mA, 5V open voltage. AMP Spec. 109-5208 Condition A

Fig. 1 (Continue)

3.6.13	Degrees of Protection	IP67 (Dust-tight and protected temporary immersion in water)	IEC 60529
Environmental Requirements			
3.6.14	Thermal Shock	⊿R= 20 mΩ Max. (Final) ⊿R= 500 mΩ Max. (GRND Final)	Mated connector -40℃/30 min.,105℃/30min. Shift time 5min MAX Making this a cycle, repeat 100 cycles. AMP spec.109-5103 Condition H
3.6.15	Humidity-Temperature Cycling	Insulation resistance 500MΩ Min. (final) ⊿R=20 mΩ Max. (Final) ⊿R=500 mΩ Max. (GRND Final)	Mated connector, 25～65℃, 90～95 % R. H. 10 cycles Cold shock -10℃ performed AMP Spec. 109-5106
3.6.16	Temperature Life (Heat Aging)	⊿R=20 mΩ Max. (Final) ⊿R=500 mΩ Max. (GRND Final)	Mated connector 105°C, Duration :250hours AMP Spec. 109-5104-3 Condition C

Fig. 1 (End)

Note 1: Shall meet visual requirements, show no physical damage and meet requirement of additional tests as specified in the test sequence shown in Figure 2.

4. Product Qualification Test Sequence

Test Examination	Test Group										
	1	2	3	4	5	6	7	8	9	10	
	Test Sequence (a)										
Examination of Product	1,4	1,3	1	1	1,7	1,7	1	1,5	1	1,5	
Termination Resistance (Low Level)					3,6	2,4,6		2,4	2,5	2,4	
Insulation Resistance	2								3,6		
Dielectric Withstanding Voltage	3								7		
Temperature Rising		2									
Post Contact Insertion Force			2								
Post Contact Retention Force				2							
Connector Mating Force					2						
Connector Un-mating Force					4						
Durability (Repeated Mating /Un-mating)					5						
Vibration						5					
Physical Shock						3					
Degrees of Protection							2				
Thermal Shock								3			
Humidity-Temperature Cycling									4		
Temperature Life (Heat Aging)										3	
Number of samples (set)	5	5	5	5	5	5	5	5	5	5	

Fig. 2

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

Part Number	Description
2108418-1	ENCODER 9P BASE ASSY
2108422-1	ENCODER 9P BASE INNER HSG
2069391-2	POST CONTACT 1.5VP REMODEL
2201825-1	ENCODER CABLE I/O KIT, MICRO MOTOR PLUS
2174065-4	REC CONTACT, MICRO MOTOR PLUS

Appendix 1