

1.0 SCOPE

1.1. Content:

This specification covers product performance, test methods and quality requirements for Micro Motor Connector for Power & Brake connection, Applicable product descriptions and part numbers are as shown on product drawing.

1.2. Qualification:

When tests are performed on the subject product line, procedures specified shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2.0 APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. 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 Documents:

- 501-137039: Test Report.
- C-2271268: Customer drawing

3.0 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 product drawing.

3.4 Ratings

- A. Voltage: 380 VAC Max for Power pin, 48 VDC max. for Brake pin
- B. Current: 5 A Max for Power Pin, 2A Max. for brake pin
- C. Operating Temperature: -40 C to 125C(including T-rise)
- D. Storage Environment: Temperature: - 5°C to 40°C Relative humidity: 15%-70%
- E. Protected degree: IP67/IP65

3.5 Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements. Unless otherwise specified, all tests shall be performed in the room temperature (5~35°C), relative humidity (45~85%), air pressure (86~106kPa), and special case temperature (18~22°C), relative humidity (60~70%), unless otherwise specified.

3.6 Test Requirements and Procedures Summary

3.6.1 EXAMINATION:

Test Description	Requirement	Procedure
Examination of the product	Meets visual requirements.	Visual inspection per product drawing. Per EIA-364-18

3.6.2 ELECTRICAL

Test Description	Requirement	Procedure
Contact Resistance	30 mΩ Max(initial),50 mΩ Max(final) 100 mΩ Max(for grounding initial) 150 mΩ Max(for grounding final)	Subject specimens to rated current. Per EIA-364-06
Insulation resistance.	500M Ω Min.	Unmated connector with 500 V DC between adjacent contacts for 1 min. Per EIA-364-21
Dielectric withstanding Voltage	No breakdown.	Unmated connector with 2500 V AC between adjacent contacts for 1 min. Per EIA-364-20
Temperature Rising	The temperature rise should be 30°C Max.	Mated connector measured at max rated current with series all contacts. Per EIA-364-70

3.6.3 MECHANICAL

Test Description	Requirement	Procedure
Mating force	17.64N Max.	Measure the force at a max rate of 25mm without outer housing per min. Per EIA-364-13
Unmating force	0.72 N Min.(initial) 0.48N Min.(after durability)	Measure the force required at a max rate of 25mm without outer housing per min. Per EIA-364-13
Cable retention force	100N min.	Measure the force per IEC61984 section 6.17
Contact Insertion force	7.84N Min. per contact	Apply an axial pull-off load to crimped wire. Operation Speed : 25 mm/min.
Contact retention force	14.7N Min. per contact	Apply an axial pull-off load to crimped wire. Operation Speed : 25 mm/min.
Contact crimp strength	18AWG 65N,22AWG 45N	Apply an axial pull-off load to crimped wire of contact secured on the tester, Operation Speed : 25 mm/min.
Durability	No mechanical damage No change to performance Contact resistance: 30mΩ Max.	Mating and unmating specimens for 100 cycles by manual without outer housing Per EIA-364-09.
Sinusoidal vibration	No discontinuities of 1 microsecond or longer duration.	Mated connectors 100 mA applied. Vibration Frequency : 10~500~10 Hz / 15 min at 1.5 mm amplitude. Accelerated Velocity : 98 m/s ² (10 G) Vibration Direction: X,Y,Z Duration: 3 hours each EIA 364-28 Test Condition 2
Mechanical shock	No discontinuities of 1 microsecond or longer duration.	Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks. Per EIA-364-27, Condition E.

3.6.4 Environmental

Test Description	Requirement	Procedure
Thermal shock	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 3.6.5)	Mated connector -55°C/30 min., 85°C/30 min. Making this a cycle, repeat 25 cycles. The measurement is held after being left indoor for 3 hours. EIA 364-32 Method A
Humidity (Temperature cycling)	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 3.6.5)	Mated connector, 25~65°C,80~98 % R. H. Cold shock -10°C for 3 hour as figure 2 in EIA-364-31, 1cycle=24hours Repeat 10 cycles The measurement is held after being left indoor for 3 hours. EIA 364-31C Method 4
SO ₂ Gas	No corrosion influence performance	Mated conn. SO ₂ Gas : 10ppm. 95%RH 25°C, 96hours
Temperature life	No physical damage, and meet requirements of additional tests specified in Product Qualification Test Sequence (Item 3.6.5)	Subject mated specimens to 105 °C for 96 hours. Per EIA-364-17B, Method A, Test Condition 4.
Waterproof	No change to performance	Under 1 m depth water for 30 minutes Per IEC 60529 IPX7, 12.5L/min for 3 minutes one side,IPX5

*Remark: The text “**No mechanical damage**” means No structure is damaged/No connection becomes loose/The specimen still is fully functional in electricity after testing.*

3.6.5 Product Qualification and Requalification Test Sequence (Sample Size: 5pcs for each group)

Test group	1	2	3	4	5	6	7	8	9
Examination of product	1,7	1,19	1,3	1,4	1,3	1,7	1,7	1,5	1,9
Contact Resistance	2,4,6	2,5,8,12,14,18						2,4	2,6
Insulation resistance.		3,16				2,5	2,5		3,7
Dielectric withstanding Voltage		4,17				3,6	3,6		4,8
Temperature Rising			2						
Mating force		6,10							
Unmating force		7,11							
Wire retention force									
Contact insertion force				2					
Contact retention force				3					
Contact crimp strength					2				
Durability		9							
Sinusoidal vibration	3								
Mechanical shock	5								
Water proof						4(IP X7)	4(IP X5)		
Thermal shock		13							
Humidity (Temperature cycling)		15							
SO ₂ Gas								3	
Temperature life									5

4.0 Quality Assurance Provisions

4.1 Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production.

B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified.

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification