

**CLUSTER BLOCK 3P CLIP HSG**

**1. SCOPE**

1.1. Content

This specification covers the requirements for product performance, test methods and quality assurance provisions of the TE Cluster Block Assembly consisting of three terminal leads and their containing housing block which is designed to mate with the Three-Position 2.3mm Dia. Pin for Refrigerator Motor (herein after referred to as Fusite Pin).

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

1.2. Qualification

When testing the named products the following specified specifications and standards shall be used. All tests have to be done using the applicable inspection plan and product drawing.

**2. APPLICABLE DOCUMENTS AND FORMS**

The following AMP 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. TE Connectivity Specifications

- 109-5000 : Test Specification, General Requirements for Test Method
- 114-5235 : Application Specification
- 502-32086 : Engineering Test Report

2.2. Commercial Standards and Specifications

- MIL-STD-202

**3. REQUIREMENTS**

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing. The shape and dimensions of the gauge pin shall be as indicated in Fig.1

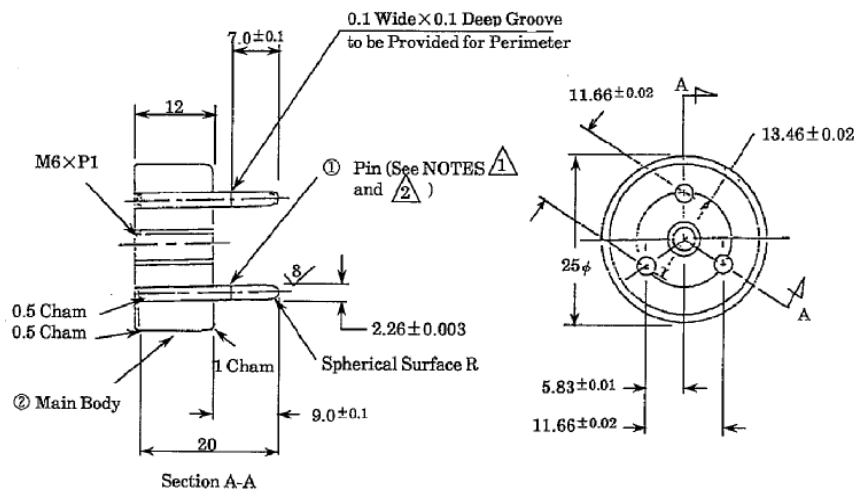


Fig.1

NOTES,

- 1. The pin ① shall be press fit into the main body ②.
- 2. The surface shall be well polished vertically and the end shall have a smooth spherical surface R.
- 3. The gauge pin material shall use tool steel JIS. SKS-3.

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable TE drawing.

- A. Contact : Copper Alloy (Tin Plated )
- B. Cluster Housing : PBT resin (UL 94V-0 , GWT)
- C. TPA Housing : PA66

3.3. Ratings

- A. Voltage Rating: 300VAC
- B. Current Rating: The current rating shall be as follows according to the size of wires connected.
  - AWG #20: 5A (MAX)
  - AWG #18: 7A (MAX)
  - AWG #16: 10A (MAX)

Wire	P/N:5-170063-2
Wire Size (mm <sup>2</sup> )	0.5~1.43 (AWG 20~ 16)
Insulation Diameter (mm)	2.0~3.4

- C. Temperature Rating: -40 to 105°C

3.4. Performance Requirements and Test Description

The product shall be designed to meet the electrical, mechanical and environmental Performance requirements specified in Fig. 2.

All tests shall be performed at ambient environmental conditions otherwise specified.

3.5. Test Requirements and Procedure Summary

Test Description	Requirement	Procedure
Examination of Product	Meets requirements of product drawing and TE Specification 114-5235	Visual inspection No Physical damage
<b>Electrical</b>		
Dielectric withstanding Voltage	No creeping discharge nor flashover shall occur.	2.7 kVAC for 1 second. Test between adjacent circuits of unmated connectors. MIL-STD 202-301
Termination Resistance	5mΩ Max. (Initial) 8mΩ Max. (Final)	Subject mated contacts assembled in housing to 20mV max. Open circuit at 10Ma. See Fig.4 TE Spec 109-5311-1
Temperature Rising	When subjected to test current of 10 amp d.c. mated connectors shall not	According to test method specified in Fig.3 while increasing test potential by

	show a temperature rise greater than 35 °C.	5 amp d.c., measurement shall be done until the temperature rises up to 150 °C. The applicable pin shall be the Fusite Pin of part No. 393-38		
<b>Mechanical</b>				
Crimp Tensile Strength	Wire Size		Apply an axial pull-off load to crimped on a 150mm long wire of contact secured on the tester, Operation Speed: 100mm/min. TE Spec. 109-5205	
	mm <sup>2</sup>	(AWG)		N ( Kgf)
	0.50	20		78.4(8.0)
	0.75	18		98.0(10.0)
	1.25	16	147.0(15.0)	
Contact Retention Force	68.6 N ( 7Kgf) Min. without TPA 83.4 N (8.5kgf) Min with TPA		The contacts crimped on an approximately 150mm long wire and then assembled in the housing shall be set to a tensile tester, and an axial pull-off load shall be applied to the crimped wire. Operation Speed: 100mm/min. TE Spec. 108-5212	
Connector Mating Force	3Pos: 134.4N(13.7kgf)Max.(Initial) 156.8N(16.0kgf )Max. (6th)		Operation Speed: 100mm/min. Measure the force required to mate connectors. TE Spec. 109-5206 Condition The gauge pin shown in Fig.2 shall be used.	
Connector Unmating Force	3Pos. : 37.3N( 3.8kgf )Min.		Operation Speed: 100mm/min. Measure the force required to unmate connectors. TE Spec. 109-5206 Condition The gauge pin shown in Fig.2 shall be used.	
Contact Unmating Force	12.1 N (1.23 kgf) Min.		Operation Speed: 100 mm/min. Measure the force required to unmate contact. TE Spec. 109-5206 Condition The applicable pin shown in Fig.4 shall be used.	
Contact Insertion Force	14.7 N (1.5 kgf) Max.		Measure the force required to insert contact in housing. TE Spec. 109-5211	
Durability (Repeated Mate/Unmating)	8m Ω Max		No. of Cycles: 6 cycles	
<b>Environmental</b>				
Thermal Shock	8m Ω Max. (Final)		Mated connector -55 30min / 85 30min Making this a cycle, repeat 250 cycles. TE Spec. 109-5103 Condition A MIL-STD-202 Method 107-1 Condition A-1 The Measurement is held after being left indoor for 3 hours.	

Figure 2



**NOTE**

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in **Error! Reference source not found.**

3.6. Product Qualification and Requalification Test Sequence

Test or examination	Test Group							
	1	2	3	4	5	6	7	8
	Test Sequence: see note (a)							
Examination of product	1,3	1,3	1,7	1,3	1,3	1,3	1,3	1,5
Dielectric withstanding voltage	2							
Temperature Rising		2						
Connector Mating Force			3					
Connector Unmating Force			4					
Contact Insertion Force							2	
Contact Retention Force				2				
Contact Unmating Force					2			
Crimp Tensile Strength						2		
Termination Resistance (Low Level)			2,6					2,4
Durability(Repeated Mate/Unmating)			5					
Thermal Shock								3

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

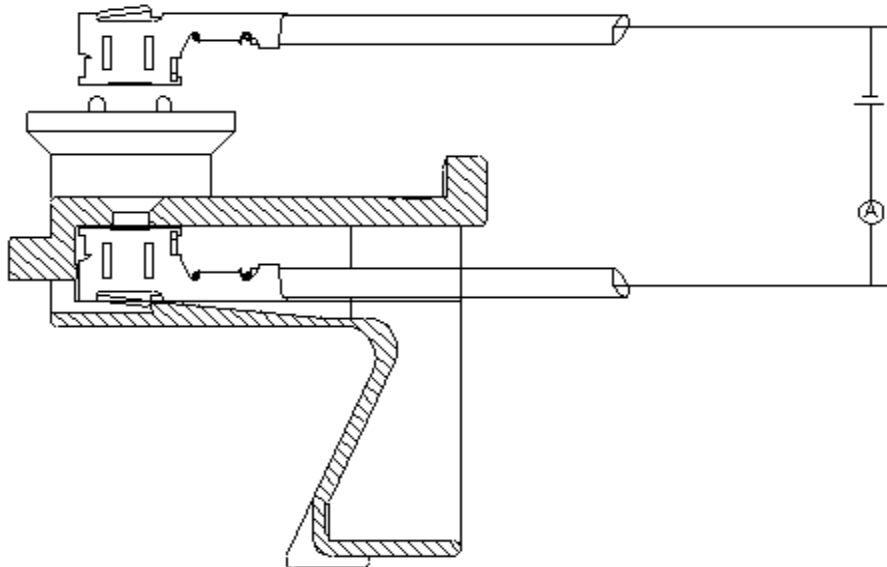
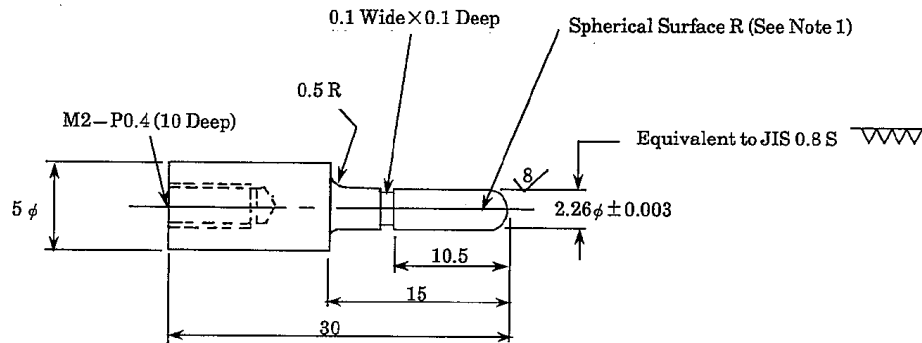


Fig.3 Termination Resistance (Low Level) and Temperature Rising

The lead length shall be 150mm for heat dissipation and the test wire shall be 0.75mm<sup>2</sup> size. (AWG # 18)



Notes (1) The surface shall be well polished vertically and the end shall be a spherical surface R.

(2) Gauge Pin Material : Tool Steel JIS SKS<sup>1</sup>-3

Fig 4

#### 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 shown in Figure 5.

Temperature	15°C – 35°C
Relative Humidity	45% – 75%
Atmospheric Pressure	86.6 – 106.6 kPa

Figure 5

##### 4.2. Qualification Testing

###### A. Specimen Selection

Specimens shall be prepared in accordance with applicable instruction sheets and shall be selected at random from current production. All test groups shall each consist of 10 Cluster block housings or assemblies, 1 assembly per wire size.

###### B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 5.

##### 4.3. 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.

##### 4.4. Acceptance

Acceptance is based on verification that the product meets the requirements in Figure 5. 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 resubmittal.

#### 4.5. 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.

Cluster Block Part No.	Applicable Terminal Part No.
2005820-1 /1-2005820-1 ( Housing )	5-170063-2
2-2005820-9/3-2005820-9 (GWT Housing)	
2108798-1 (TPA)	

Appendix 1