



Ring Tongue Terminal

螺母端子

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1. SCOPE 适用范围

1.1. Content 内容

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) ring tongue terminal. The product described in this document has not been fully tested to ensure conformance to the requirements outlined herein. TE Connectivity makes no representation or warranty, express or implied that the product will comply with these requirements. Further, TE Connectivity reserves the right these requirements based on the results of additional testing and evaluation. Contact TE Connectivity Engineering for further information. If necessary, This document will become the Product Specification at successful completion of testing. 本规范适用于螺母端子的性能，测试和质量要求。

a. 本规范适用但不仅限于以下零件号。

2050842-1	Ring Tongue Terminal Assy, M4
2050842-3	Ring Tongue Terminal Assy, M4
2050842-5	Ring Tongue Terminal Assy, M4
2050216-1	Ring Tongue Terminal Assy, M4
2050216-3	Ring Tongue Terminal Assy, M4
2050216-5	Ring Tongue Terminal Assy, M4
2050216-6	Ring Tongue Terminal Assy, M4
2419960-1	Ring Tongue Terminal Assy, M4
2419960-2	Ring Tongue Terminal Assy, M4
2419960-3	Ring Tongue Terminal Assy, M4

1.2. Qualification 鉴定

When tests are performed, the following specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

本测试规范依照下面的规范及标准执行。所有的检验应依照合适的检验计划及产品图纸执行。

2. APPLICABLE DOCUMENTS 适用文件

2.1. Usable document 使用文件

In the event of conflict between the requirements of this specification and the drawing, the drawing shall take precedent.

在本规范的要求与图纸发生冲突时，以产品图纸为准。在本规范的要求与参考文件发生冲突时，以本规范为准。

2.2. TE specifications 泰科电子规范

- 109-1: General Requirements for Testing
- 109 Series: Test Specification, Requirements for Test Methods

2.3. Other specifications 其他规范

- ASTM B117 Standard Practice for operating Salt Spray Apparatus
- USCAR Series: Test Specification, Requirements for Test Methods
- SAE J1455: Joint SAE/TMC Recommended Environmental Practices for Electronic Equipment Design (Heavy-Duty Trucks)

3. REQUIREMENT 要求

3.1. Design and Construction 设计和结构

Products must meet the design, construction and physical dimensions specified in the applicable

product drawings.

产品必须满足产品图纸上的设计、结构和尺寸要求。

3.2. Material 材料

Description of the material sees the related product drawings.

材料描述见相关产品图纸。

3.3. Ratings 等级

A. Operating Temperature / 工作温度: -55~150°C

3.4. General Performance and Test description 通用性能和试验描述

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Para.3.4. All testes must be performed at the test condition of the TE test specification 109-1 unless otherwise specified.

产品应能满足段落3.4中的电气，机械和环境等性能要求。所有试验均需按照TE规范109-1中的测试条件进行，除非另有说明。

Table 2

Test Description	Requirement	Procedure												
3.4.1 Visual Inspection	Product shall be conformable to the requirements of applicable product drawing.	Visually, dimensionally and functionally inspected per applicable quality inspection plan.												
ELECTRICAL														
3.4.2 Circuit Resistance	The total connection resistance must not exceed the values listed below: <table border="1"> <thead> <tr> <th>Wire Size (mm²)</th><th>Initial (mΩ)</th><th>After Test (mΩ)</th></tr> </thead> <tbody> <tr> <td>0.75</td><td>2.2 Max.</td><td>4.4 Max.</td></tr> <tr> <td>1.0</td><td>2.0 Max.</td><td>4.0 Max.</td></tr> <tr> <td>1.5</td><td>1.8 Max.</td><td>3.6 Max.</td></tr> </tbody> </table>	Wire Size (mm ²)	Initial (mΩ)	After Test (mΩ)	0.75	2.2 Max.	4.4 Max.	1.0	2.0 Max.	4.0 Max.	1.5	1.8 Max.	3.6 Max.	Measuring current : 100mA Open circuit voltage 20mV. See Fig1. USCAR-Test 5.3.1
Wire Size (mm ²)	Initial (mΩ)	After Test (mΩ)												
0.75	2.2 Max.	4.4 Max.												
1.0	2.0 Max.	4.0 Max.												
1.5	1.8 Max.	3.6 Max.												
3.4.3 Voltage Drop	The total connection resistance must not exceed the values listed below: <table border="1"> <thead> <tr> <th>Wire Size (mm²)</th><th>Initial (mΩ)</th><th>After Test (mΩ)</th></tr> </thead> <tbody> <tr> <td>0.75</td><td>2.2 Max.</td><td>4.4 Max.</td></tr> <tr> <td>1.0</td><td>2.0 Max.</td><td>4.0 Max.</td></tr> <tr> <td>1.5</td><td>1.8 Max.</td><td>3.6 Max.</td></tr> </tbody> </table>	Wire Size (mm ²)	Initial (mΩ)	After Test (mΩ)	0.75	2.2 Max.	4.4 Max.	1.0	2.0 Max.	4.0 Max.	1.5	1.8 Max.	3.6 Max.	Measuring current =1A Open circuit voltage: 20V. See Fig2. USCAR-Test 5.3.2
Wire Size (mm ²)	Initial (mΩ)	After Test (mΩ)												
0.75	2.2 Max.	4.4 Max.												
1.0	2.0 Max.	4.0 Max.												
1.5	1.8 Max.	3.6 Max.												
3.4.4 Current Capability	1- $T_{rise} < 55^{\circ}C$. 2- The calculated Total connection resistance of any sample must not exceed the "After Test" acceptance criteria, listed in 3.4.3 above.	Wire Range Imax 0.75mm² : 10A 1.00mm² : 15A 1.50mm² : 20A 2.00mm² : 25A 2.50mm² : 30A DC_{MAX} = 20V												

Table 2

Test Description	Requirement	Procedure										
		USCAR-Test 5.3.3										
3.4.5 1008 Hour Current Cycling	1- $T_{rise} < 55^{\circ}\text{C}$. 2- The calculated Total connection resistance of any sample must not exceed the "After Test" acceptance criteria, listed in 3.4.3 above.	Wire Range Test Current 0.75mm ² : 10A 1.00mm ² : 15A 1.50mm ² : 20A 2.00mm ² : 25A 2.50mm ² : 30A 45min "ON" and 15min "OFF" per cycle. USCAR-Test 5.3.4										
MECHANICAL												
3.4.6 Wire Retention Force	<table><tr><th>Wire Size (mm²)</th><th>Min. Crimp Tensile (N)</th></tr><tr><td>0.75</td><td>120</td></tr><tr><td>1.0</td><td>160</td></tr><tr><td>1.5</td><td>200</td></tr><tr><td>2.5</td><td>250</td></tr></table>	Wire Size (mm ²)	Min. Crimp Tensile (N)	0.75	120	1.0	160	1.5	200	2.5	250	Apply an axial pull-off load to crimped wire of contact secured on the tester. Operation Speed: 100mm/min. TE Spec. 109-5205
Wire Size (mm ²)	Min. Crimp Tensile (N)											
0.75	120											
1.0	160											
1.5	200											
2.5	250											
3.4.7 Bend Resistance	1. Bending Force: 20N min. 2. There is no signs of metal cracking or tearing in the area around the bend.	Gradually apply a force to the terminal and record the peak force necessary to bend the terminal 30 o + 5 o from its centerline. (Including upwards & downwards) Applied Speed: <50mm/min See Fig3. USCAR-Test 5.2.2										
3.4.8 Nut Removal Force	Vertical direction: 60 N min. Horizontal direction:20N min.	Separately add an vertical or horizontal force to pull or push the nut until the nut fall off from the terminal wings. See Fig4.										
ENVIRONMENTAL												
3.4.9 Thermal Shock	Each terminal shall meet the Voltage Drop requirements after the thermal shock test. List in 3.4.3 above.	-40°C/30min. 150°C/30min. Repeat 144cycles. USCAR-Test 5.6.1										
3.4.10 Heat Resistance	Each terminal shall meet the Voltage Drop requirements after the thermal shock test. List in 3.4.3 above.	150±2°C for 120 hours TE spec: 109-5104										

Table 2

Test Description	Requirement	Procedure
3.4.11 Salt Spray	The calculated Total connection resistance of any sample must not exceed the "After Test" acceptance criteria, listed in 3.4.3 above.	Put the terminal in the salt spray chamber, after 96 hours, take them out, test Voltage Drop. ASTM B117
3.4.12 Vibration	No electrical discontinuity greater than 1μs shall occur.	100 hours in each of three mutually perpendicular planes. Test must be combined with temperature fluctuation: 0.5 hours -40°C 9.5 hours 25°C 90 hours 135°C Samples fix method See Fig5. SAE J1455-Test 4.9(Figure 9)

3.5. Product Qualification and Requalification Test Sequence 试验顺序

Test samples were subjected to the following tests in the order given. Each test group had five mated pair test samples.

Test or Examination		Test Group							
		A	B	C	D	E	F	G	H
		Test Sequence							
3.4.1	Visual Inspection	1	1	1	1	1	1	1	1
3.4.2	Circuit Resistance	2							
3.4.3	Voltage Drop	3, 5	2, 4	2, 4				2,4,6	
3.4.4	Current Capability		3						
3.4.5	1008 Hours Current Cycling			3					
3.4.6	Wire Retention Force				2				
3.4.7	Bend Resistance					2			
3.4.8	Nut Removal Force						2		
3.4.9	Thermal Shock							3	
3.4.10	Heat Resistance							5	
3.4.11	Salt Spray	4							
3.4.12	Vibration								2

4. QUALITY 质量

4.1. Qualification test 鉴定

Samples must be in accordance with drawings and be taken in a random way in the production in progress.

样件必须与产品图纸一致，并且是生产过程中随机选取的。

4.2. Requalification test 重新鉴定

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

如果产品或者制造过程中有显著影响外观，装配和功能的设变，质保需要协调按照原先工程定义的测试顺序，重新验证全部或者部分测试项目。

4.3. Acceptance 验收

Acceptance is based on verification that the product meets the requirements of section 3.6. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmitted.

归咎于测试设备，样件安装或者操作员的失误的失效不应判定产品不合格。当产品失效发生时，需要有纠正措施以及重新提交样件进行验证。在重新验证前，需确认已有纠正措施。

4.4. Quality conformance inspection 质量合格检验

The applicable TE Connectivity quality inspection plan will 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

TE Connectivity 的质量检验计划将指定适用的质量标准。尺寸和功能要求，应按照适用的产品图纸和本规范。

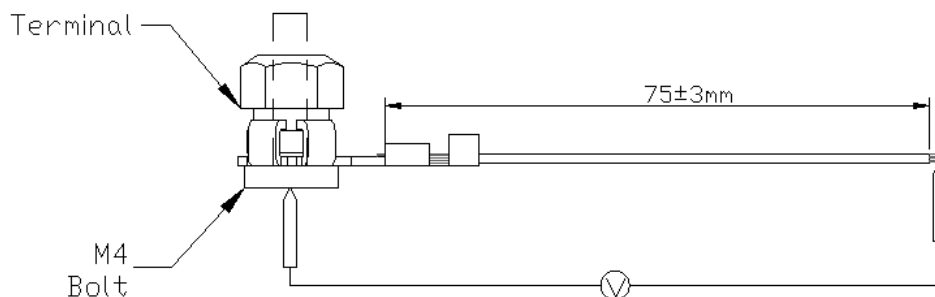


Fig. 1

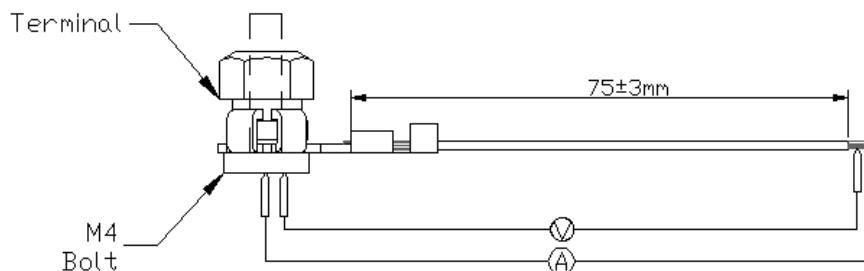


Fig. 2

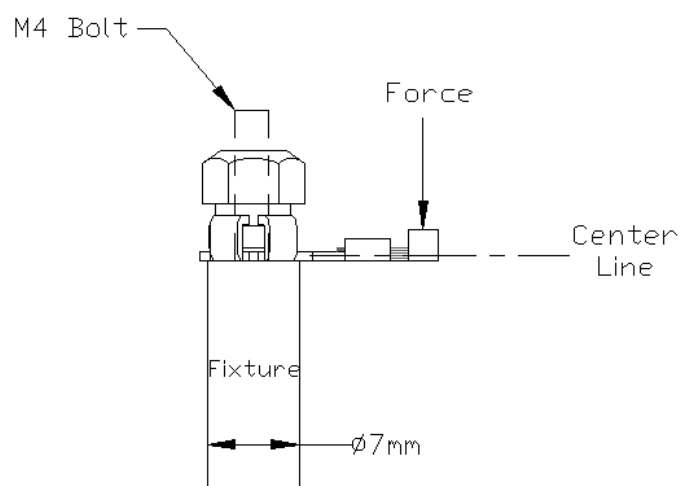


Fig. 3

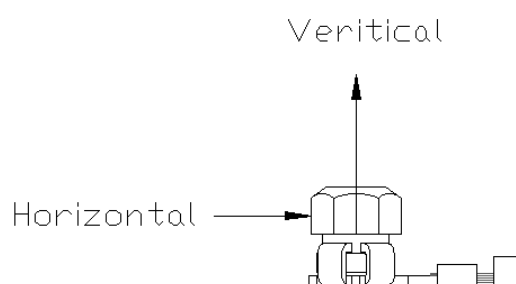


Fig. 4

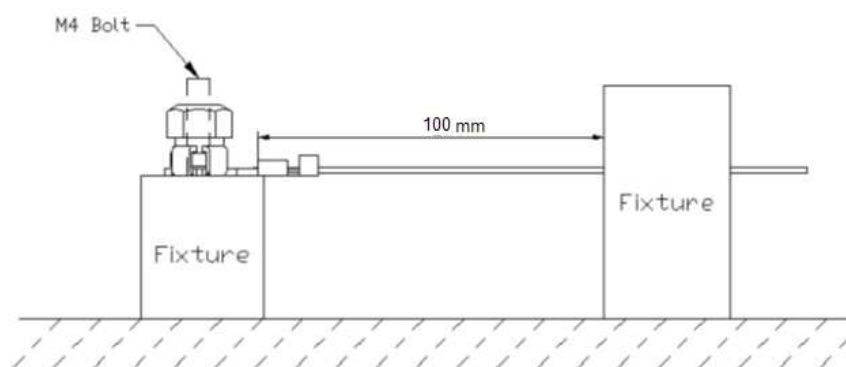


Fig. 5