

Test Report

测试报告

Multi-Position Mounted FASTIN-FASTON Connector, Free Hanging (MMF connector)

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1. INTRODUCTION

1.1 Purpose 测试目的

Testing was performed on Multi-Position Mounted FASTIN-FASTON Connector, Free Hanging (MMF connector) to determine its conformance to the requirements of Product Specification 108-106178-1. 测试的目的是检测 MMF 产品是否符合产品规范要求 108-106178-1。

1.2 Scope 适用范围

This report covers the electrical, mechanical, and environmental performance of Multi-Position Mounted FASTIN-FASTON Connector, Free Hanging (MMF connector). 本实验报告包括对 MMF 连接器进行的电气，机械，环境性能测试。

1.3 Product Description 产品描述

The product tested in this test report is 3 position MMF connector with 14# wire, unless specified. 测试样品是三位的 MMF 连接器，除非是特殊说明，样品使用 14 号线径。

1.4 Environmental Conditions 环境状况

Unless otherwise stated, the following environmental conditions prevailed during testing: 除非特殊说明，本次试验的环境条件为：

Temperature 温度: 15°C to 35°C
 Relative Humidity 湿度: 25% to 75%

1.5 Qualification Test Sequence

Test or Examination	Test Group										
	A	B	C	D	E	F	G	H	I	J	K
	Test Sequence (a)										
Examination of product	1,3	1,4	1,4	1,4	1,3	1,4	1,4	1,4	1,4	1,3	1,4
Termination Resistance				2		3	3	3	3		3
Insulation Resistance				3							
Dielectric withstanding voltage					2						
Temperature rise	2										
Contact insertion force		2									
Contact retention force		3									
Connector mating force(3Pos.)			2								
Connector um-mating force(3Pos.)			3								

Vibration (Low Frequency)									2		
Humidity Steady State						2					
Resistance to Heat								2			
Resistance to Cold									2		
Glow wire test										2	
Salt Spray											2

*** Notes:**

- (a) Numbers indicate the sequence in which the tests are performed.
- (a) 数字表示测试顺序。

2. TEST CONTENT

Item	Test Items	Requirement	Procedures		
2.1	Product Examination 产品检查	Meets requirements of product drawing 符合图纸要求	Visual inspection No physical damage 外观没有物理损伤。		
Electrical Performance Requirements					
2.2	Termination Resistance 接触阻抗	10mΩ Max (after the test) 10 mΩ 最大	Subject mated contacts assembled in housing to 50 mV Max open circuit at 50mA. 样品处于 50mV,最大 50mA 测试回路。		
2.3	Termination Resistance (Specified Current) 接触阻抗 (指定电流)	Wire AWG #	Current(A)	Voltage drop(mV)Max	Measurement shall be done after temperature rising becomes stabilized, by using the DC voltmeter probing between the point Y and Y'. Termination resistance is obtained by calculation after deducting the resistance of wire used for termination. The probing points shall be soldered to stabilize the measurement reading. 温升稳定之后再用电流源测量，接触阻抗应该去除线阻，测量点应该焊接在端子上确保稳定测量。
		20	5	12	
		18	7	21	
		16	10	30	
		14	15	45	
		12	20	70	

2.4	Temperature Rising (Specified Current) 温度上升 (指定电流)	Wire AWG #	Current(A)	Temp. rising (°C) Max	Measurement shall be done after temperature rising becomes stabilized. The value obtained from calculation to deduct ambient temperature from the measurement reading is amount of temperature rising. The probing points shall be soldered to stabilize the measurement reading. 温升稳定之后测量，测量值去除环境温度，测量点应该焊接在端子上确保稳定测量。
		20	5	30	
		18	7	30	
		16	10	30	
		14	15	30	
		12	20	30	
2.5	Dielectric Withstanding Voltage 耐压试验	No creeping discharge or flashover shall occur 没有沿面放电现象，没有火星产生		2kVAC for 1 minute. The test between adjacent circuits and between the contacts and ground of mated connectors. MIL-STD-202 Method 301. 施加 2KVAC 电压，持续 1 分钟。 测试在相邻电路之间和连接器与大地之间进行。	
2.6	Insulation Resistance 绝缘阻抗	100MΩ Min 最小 100 MΩ		Impressed voltage 500 V DC. Test between adjacent circuits of mated/unmated connectors. MIL-STD-202 Method 302 Condition B 施加直流 500V 电压，在连接器相邻电路测量。	
Mechanical Requirements					
2.7	Contact Insertion Force 端子插入力	Insertion Force:20N Max 最大值 20N		Operation Speed: 25.4mm/min. Measure the force required to insert force. 操作速度 25.4mm/min,测量端子插入塑胶的力量。	
2.8	Contact Retention Force 端子保持力	Retention Force:59N Min. 最小 59N		Operation Speed: 25.4mm/min. Apply an axial pull-off load to crimped wire of the contact held in housing. 操作速度 25.4mm/min,沿着端子轴向施加拉力，拉出端子的力量。	
2.9	Connector mating force	60N Max		Operation Speed:25.4mm/min	

	(with 3 contacts) 塑壳配合力	最大 60N	Measure the force required to mate connector 操作速度 25.4mm/min, 测量塑胶对配所需力量。
2.10	Connector un-mating force (with 3 contacts) 塑壳保持力	80N Min 最小 80N.	Operation Speed:25.4mm/min Measure the force required to un-mate connector with locking latch. 操作速度 25.4mm/min,测量对配塑胶分离所需力(保留锁扣)
2.11	Vibration (Low Frequency) 低频振动	No damage that affect the function. 10mΩ Max. (After the test) 产品功能无损坏 试验之后接触阻抗最大 10mΩ	EIA-364-28, Test Condition I Subject mated connectors to 10-55-10 Hz traversed in 1 minute at 1.52 mm amplitude maximum total excursion, 2 hours each in 2 axial direction. 振动频率: 一分钟内, 10-55-10Hz。 振动幅度: 1.52mm. 测试方向: 参考连接器配合轴向, 水平和垂直方向, 每个轴向振动 2 小时。
Environmental Requirements			
2.12	Humidity Steady State 稳态湿热	Termination resistance: 10mΩ Max. (After the test) Insulation Resistance:100MΩ Dielectric strength: No abnormalities shall be evident. 接触阻抗最大 10mΩ 绝缘阻抗最小 100MΩ 耐压试验: 没有异常发生	Mated connector 90-95%RH. 40±5°C 96hours The sample shall be placed in chamber to avoid falling of water drops during the test. After the test, low level termination resistance, insulation resistance and dielectric strength shall be measured after reconditioning in the room temperature. 配合好的连接器置于如下环境中, 96 小时: 90-95%RH. 40±5°C 样品应该置于特定试验环境, 防止水滴低落。试验之后, 测量低电平阻抗, 绝缘电阻和耐压试, 试验在室内温度进行。

<p>2.13</p>	<p>Resistance to Heat 耐热实验</p>	<p>Termination resistance: 10mΩ Max. (After the test) 接触阻抗最大 10mΩ</p>	<p>Mated connector 120±3℃, Duration:120 hours After the test, low level termination resistance shall be measured after reconditioning in the room temperature. 配合好的连接器置于如下环境中, 120 小时, 120±3℃ 试验之后, 测量低电平阻抗, 试验在室内温度进行。</p>
<p>2.14</p>	<p>Resistance to Cold 耐冷实验</p>	<p>Termination resistance: 10mΩ Max. (After the test) 接触阻抗最大 10mΩ</p>	<p>Mated connector -50℃, Duration:120 hours After the test, low level termination resistance shall be measured after reconditioning in the room temperature. 配合好的连接器置于如下环境中, 120 小时, -50℃ 试验之后, 测量低电平阻抗, 试验在室内温度进行。</p>
<p>2.15</p>	<p>Glow wire Test 灼热丝实验</p>	<p>Test at 750℃ (Flame duration≤2 seconds) Lighted tissue paper shall not burn 在 750℃实验条件下, 样品没有着火, 或者火焰熄灭时间 2 秒内。</p>	<p>IEC 60695-2-11 and IEC 60335-1 Housings are subjected to glow wire test as described in specs above. Perform a visual check and take photos after the test. 参考 IEC 60695-2-11, 做完灼热丝试验后, 检查外观并拍照记录。</p>
<p>2.16</p>	<p>Salt Spray 盐雾实验</p>	<p>Termination resistance: 10mΩ Max. (After the test) 接触阻抗最大 10mΩ</p>	<p>EIA-364-26, Condition A Subject mated connectors to 5% salt concentration for 96 hours. Measurement is taken after removing the salt. Specimens dried per the specification. 配合好的连接器样品放置于 5%浓度的氯化钠环境中, 持续 96 小时。除去盐雾, 样品干燥后测量阻抗。</p>

*** Notes**

A) Product must be without rust, corrosion transformation, crack and discoloration.

产品没有锈蚀，腐蚀，开裂变色。

B) Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification.

样品符合规范，没有物理上的损伤，符合产品规格书里规定的实验要求。

3. TEST RESULT

3-1 Test Group A 测试组别A

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage.

符合图纸要求，没有物理损伤

(2) Temperature rise, loading current, 15A. 温升实验，载流 15A.

UNIT: °C

Number of Sample 样品数量	4
Wire Type 线径	2.0mm ²
Max. 最大	17.3
Min. 最小	16.4
Ave. 平均值	16.7
Specification 规格	30°C max.
Judgment 判断	Pass

3-2 Test Group B 测试组别 B

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage.

符合图纸要求，没有物理损伤。

Contact insertion and extraction force 端子插入力，拔出力

UNIT: N

Test item 测试条目	Contact insertion force 端子插入力		Contact extraction force 端子保持力	
	Plug	Cap	Plug	Cap
Housing 塑壳				
Sample quantity 样品数量	6		6	
Max.最大	12.4	10.3	190.0	153.4

Min.最小	11.1	9.2	176.8	143.4
Ave.平均值	11.7	9.9	182.6	147.6
Specification 规格	20 N Max.		59N min	
Judgment 判断	Pass		Pass	

3-3 Test Group C 测试组别C

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求，没有物理损伤。

(2) Connector mating force and un-mating force 连接器配合力/保持力

UNIT: N

Test Item 测试条目	Connector mating force 连接器配合力	Connector un-mating force 连接器保持力
Sample quantity 样品数量	3	
Max. 最大	48.5	167.4
Min.最小	44.1	163.3
Ave.平均	45.9	164.7
Specification 规范	60N Max.	80N Min.
Judgment 判断	Pass	Pass

3-4 Test Group D 测试组别D

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求，没有物理损伤。

(2) Termination resistance and Insulation resistance 接触电阻和绝缘电阻。

Test Item 测试条目	Termination Resistance 接触电阻/ mΩ	Insulation resistance 绝缘电阻/10 ¹⁰ Ω
Number of Sample 样品数量	6	6
Max.最大	1.5	4.1
Min.最小	1	1.3
Ave.平均	1.2	2.6
Specification 规范	10mΩ max.	100MΩ Min.
Judgment 判断	Pass	Pass

3-5 Test Group E 测试组别E

(1) Dielectric withstanding voltage 绝缘耐压

No flashover, no breakdown occurred.没有飞弧，没有故障产生。

3-6 Test Group F 测试组别F

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求, 没有物理损伤。

(2) Humidity Steady State 温湿循环

Termination resistance does not exceed 10m Ω . 接触电阻不超过10毫欧。

3-7 Test Group G 测试组别G

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求, 没有物理损伤。

(2) Resistance to heat 耐热测试

Termination resistance does not exceed 10m Ω . 接触电阻不超过10毫欧。

3-8 Test Group H 测试组别H

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求, 没有物理损伤。

(2) Resistance to cold 耐冷实验

Termination resistance does not exceed 10m Ω . 接触电阻不超过10毫欧。

3-9 Test Group I 测试组别I

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求, 没有物理损伤。

(2) Vibration 振动测试

Termination resistance does not exceed 10m Ω . 接触电阻不超过10毫欧。

3-10 Test Group J 测试组别J

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求, 没有物理损伤。

(2) Glow wire test 灼热丝实验

Glow Wire 750 °C, no flame. 灼热丝750摄氏度 没有火焰产生

Test Group K 测试组别K

(1) Examination of product 产品检查

Meets requirements of product drawing. No physical damage. 符合图纸要求，没有物理损伤。

(2) Salt Spray 盐雾实验

Termination resistance does not exceed 10m Ω . 接触电阻不超过10毫欧。