



宁波速普电子有限公司

产 品 测 试 报 告

TEST REPORT

报告编号	SP20161203001
REPORT NO	
产品名称	多用途弹簧连接器 MCS Connector Series
NAME OF PRODUCT	
产品型号	450、425
TYPE OF PRODUCT	
委托单位	研发部 R&D Department
COSTOMER	
签发日期	2016.12.03
DATE OF ISSUE	

宁波速普电子有限公司实验室

NingBo SUPU Electronics CO., LTD. OF Laboratory

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6. 一般情况, 测试结果仅对所测试样品有效;

Generally, commission test is responsible for the tested samples only.

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宁波速普电子有限公司实验室

产 品 测 试 报 告

报告编号: **SP20161203001**

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样品名称 Sample Name	多用途弹簧连接器 Mcs connector Series	型号规格 Part ID	4501XX、4504XX/060、4251XX 4252XX、4253XX、4254XX
委托单位 Entrusted Agent	研发部 R&D Department	地址 Address	坎墩街道兴镇街 625 号 No.625 Xingzhen Street , Cixi, Ningbo
样品数量 Samples Q'ty	20 PCS/ each	送样人员 Sample delivery people	励庆青 Li qingqing
送样日期 Sample submit date	2016.11.25	测试时间 testing date	2016.11.25
样品描述、状态 Samples Description ,Status	测试样品=各 20 PCS, 良好 Tested samples =20 pcs each ,quality ok		
测试项目 Tested Item	接触电阻 Contact Resistance、温升 Temperature Rise、耐电压 withstand voltage、动作性能 Action performance、高温高湿 High temperature and humidity、交变盐雾 Alternating salt spray、IP 防护等级 IP protection rate		
测试依据 Testing standard	IEC 61984: 2008 国际标准 连接器—安全要求和测试 IEC 61984 :2008 International standard connector- safety requirement		

	and testing IEC 60068-2-52: 1996 环境试验 第 2 部分: 试验方法 试验 Kb: 盐雾, 交变 (氯化钠溶液) IEC 60068-2-52 : 1996 Environmental test ,Part 2 : Testing method , testing , Kb : Salt spray , Alternating (sodium chloride, NaCl) IEC 60529: 2001 国际标准 外壳防护等级 (IP 代码) IEC 60529: 2001 International standard .shell protection class (IP code)
测试结论 Testing Result	判定结果 Result: 多用途弹簧连接器 450、425 经测试, 结果合格 MCS connector 450 , 425 series , testing result is qualified  Date: 2016/12/03
备注 Remark:	应客户需求, 高温高湿参数设定为 50℃、90%RH, 时间为 7 天, 所有测试项目均在高温高湿环境中或高温高湿结束后进行 According to the customer requirement ,the high temperature and humidity set to :50℃、90%RH , timing is 7 days , all the testing should be done during the high temperature and humidity environment or after high temperature and humidity test finished .
编制 Made by : 黄亮	批准 Approved by : 张珂

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1. 测试原因 Testing Reason

客户需求 According to customer requirment

2. 测试目的 Testing aim

多用途弹簧连接器须通过接触电阻、温升、耐电压、动作性能、
高温高湿、交变盐雾、IP 防护等级测试要求

The Mcs series should pass the testing : Contact Resistance、
Temperature Rise、withstand voltage、Action performance、High
temperature and humidity、Alternating salt spray、 IP protection rate

3. 测试范围 Testing Scale

样品=各 20 PCS samples 20 each

4. 测试类型 testing type

常规试验 Normal testing

5. 测试标准 testing standard

IEC 61984: 2008 国际标准 连接器—安全要求和测试 IEC

61984 :2008 International standard connector- safety requirement and testing

IEC 60068-2-52: 1996 环境试验 第 2 部分: 试验方法 试验 Kb: 盐雾, 交变 (氯化钠溶液)

IEC 60068-2-52 : 1996 Environmental test ,Part 2 : Testing method , testing , Kb : Salt spray , Alternating (sodium chloride, NaCl)

IEC 60529: 2001 国际标准 外壳防护等级 (IP 代码)

IEC 60529: 2001 International standard .shell protection class (IP code)

6. 测试管理 Testing management

6.1 测试人员 testor ;

表 1 测试项目及人员 Table 1: Testing item and testor

试验项目 Testing item	负责人 testor
1. 试验方案、计划 testing proposal , plan	郑静露 Zheng Jinglu
2. 试验准备 Preparation of testing	邹玲 Zou Ling
3. 实施 Testing carry out	郑静露、邹玲 Zheng jinglu. Zouling

6.2 测试要求 Testing requirement

高温高湿测试 High Temperature and Humidity: 温度

Temperature: 50℃; 湿度 Humidity: 90%

时间 time: 7D

接触电阻测试 Contact Resistance: 试验电流 Current: 1A

测量点 Testing point: 端子的末端 the end of the terminal

温升测试 Temperature Rise: 425 系列 series: 测试线径 wire
range: 0.5mm²

测试电流 Crrrent: 4A

线径长度 length of wire: 500±50mm

450 系列 series: 测试线径 wire range: 2.5 mm²

测试电流 Current: 12A

线径长度 Length of wire: 500±50mm

耐电压测试 Withstand Voltage 测试电压 TestingVoltage:

425 系列 series: 1390V

450 系列 series: 2210V

测试时间 Time : 1min

测量点 testing point: 夹紧件与夹紧件之间

夹紧件与外壳之间 between two

clamping parts and between the clamp and housing .

动作性能 Action Performance: 测量点 Testing point: 弹簧打

开口 the spring cage open point 、产品对插处 the product connection point

测试次数 testing times: 5 次 times

交变盐雾测试 Alternating salt spray testing : 5%的氯化钠溶液 5% sodium chloride, NaCl

箱体温度 Temperature of the case: 35℃; PH: 6.5-7.2

严酷等级: 三个喷雾周期, 每个盐雾周期为 2H, 湿热
周期为 22H, 24H 为一个周期

Harsh Level :3 salt spray period , each one is 2H .damp
and hot period is 22H , so the whole cycle is
24H.

IP 防护等级测试 IP protesting class rate: IPXX

第一位特征数字 the 1st future number: 第二位特征数字 the 2ed future
numeber:

- | | |
|------------------------------------|---|
| 0 (无防护 No protection) | 0 (无防护 No protection) |
| 1 $\geq 50\text{mm}$ 直径 Diameter | 1 垂直滴水 vertical dropping |
| 2 $\geq 12.5\text{mm}$ 直径 Diameter | 2 滴水 (倾斜 15°) dropping (with 15° angle) |
| 3 $\geq 2.5\text{mm}$ 直径 Diameter | 3 喷雾水 (water mist) |
| 4 $\geq 1.0\text{mm}$ 直径 Diameter | 4 溅水 splash |
| 5 防尘 dustproof | 5 喷水 water spray |

6 隔尘 Dusttight

6 猛烈喷水 Violent water spray

7 短时间浸水 Water immersion in
short time

8 连续浸水 Continuous flooding

6.3 测试方法

高温高湿测试: 将测试箱开启后设定 50℃温度, 90%湿度,
运行 7 天, 主要用于辅助其他测试项目

High temperature and humidity test: Select the cabinet to 50℃
& 90% humidity. Keep on running 7 days to
assistant other program.

触电阻测试: 高温高湿测试前后分别测接触电阻

将产品对插后两端接线, 用测试夹头分别夹
紧两边端子末端导线, 并记录数据

初始测量 R1: 为后续测量作为测量基准

最终测量 R2: $\leq 1.5R1$ 或 $R1+5m\Omega$, 取较大值

Contact Resistance Test: Test the contact resistance before and after
high

temperature & humidity test.

Wiring after the products plugged in each
other, Clip both of the connector wire ends by

test clamp and record.

Original Test Record R1: which is the basic
measuring .

Final Test Record $R2 \leq 1.5R1$ or $R1 + 5m\Omega$,

Choose the bigger one.

温升测试: 在高温高湿测试中进行测试

用最大线径的横截面积导线将产品串联连接,

通以额定电流, 测试时间为 5H

连接器与环境温度的总和不能超过 105℃

Temperature Rise Test: On the condition of high temperature and
humidity.

Test 5 hours after connecting the max wire range
products by series circuits with rated current .The
added temperature of connector and surrounding
cannot be over 105℃.

耐电压测试: 高温高湿测试结束前 1-2H 之间测试

频率: 50-60HZ, 正弦波

施加速率: 500V/S

将产品引出端接上测试夹头，用测试棒分别对
相邻夹紧件和外壳进行耐电压测试
产品应无击穿或飞弧现象

Withstand Voltage Test: Test 1-2 hours before the ending of high
temperature & humidity test.

Frequency: 50-60Hz Sinusoidal wave

Speed Rate: 500V/S

Fix the test clamp , Then test the withstand voltage
to the border clip parts and the housing .

It was no allowed to have breakdown or flashover.

动作性能测试:在高温高湿测试结束后进行测试

用螺丝刀插入弹簧打开口，至完全打开弹簧，
反复 5 次

将测试产品对插，至完全插合，反复插拔 5
次

弹簧打开口、产品对插处均不应出现任何影
响其进一步使用的破损

Action performance test: Test after high temperature and humidity test.

Open the spring totally by screw driver.

Repeating 5 times.

Plug in the products fully, and plug in & out
5 times

It cannot has any problems on the spring
opening mouth or products itself connecting

交变盐雾测试: 将试样放入盐雾箱中, 在 35℃ 下喷盐雾 2H

每次喷雾结束后, 将试样转移到湿热箱中
储存 22H

测试前后进行接触电阻及动作性能试验

Alternating salt spray test: Put the samples into the salt spray
cabinet. Spraying for 2 hours in 35℃ .

Forward the samples to the Hot and humidity
case for 22 hours.

Record the Contact Resistance & action
both before and after the test.

IP 防护等级测试: 用防护设备或工具对产品进行 IP 防护等
级测试, 分别进行防水与防尘测试

IP protection rate Test: Test the products on waterproof and

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dustproof by protecting device or tools

6.4 样品要求 Samples request

样品=各 20 PCS samples 20 pcs each

6.5 测试时间 testing time

2016/11/25- 2016/12/03

7. 测试结果 Testing Result

测试项目 Testing items	测试标准 testing standard	测试结果 Testing result	判定 Adjustment
接触电阻 Contact Resistance	高温高湿测试前后分别测接触电阻 Test the contact resistance before and after the high temperature and humidity test 试验电流: 1A Testing Current: 1A 测量点: 端子的末端 Tested point: The end of the terminal 初始测量 R1: Original Test Record R1 为后续测量作为测量基准 Basic measuring for the following tests 最终测量 R2: $\leq 1.5R1$ 或 $R1+5m\Omega$, 取较大 Final test record R2: $\leq 1.5R1$ or $R1+5m\Omega$,	详见附件 1 See Appiendix 1	OK

	Choose the bigger one		
温升 Temperature Rise	在高温高湿测试中进行测试 On the condition of high temperature and humidity 425: 测试线径 wire range: 0.5mm ² 测试电流 Current: 4A 线径长度 length of wire: 500±50mm 450: 测试线径 wire range: 2.5 mm ² 测试电流 Current: 12A 线径长度 length of wire: 500±50mm 连接器与环境温度的总和不能超过 105℃ The added temperature of connector and surrounding can be over 105℃	详见附件 2 See Appiendix 1	OK
耐电压 Withstand Voltage	高温高湿测试结束前 1-2H 之间测试 Test1-2 hours before the ending of high temperature and humidity test. 测试电压 Tested Voltage: 425 系列 Series: 1390V 450 系列 Series: 2210V 测试时间 Testing time: 1min	详见附件 3 See Appiendix 1	OK

	测量点 Tested point: 夹紧件与夹紧件之间 the border clip parts 夹紧件与外壳之间 between the clip parts and the housing 产品应无击穿或飞弧现象 It was no allowed to have breakdown or flashover		
动作性能 Action Performanc e	高温高湿测试结束后进行测试 Test after high temperature and humidity test. 用螺丝刀插入弹簧打开口, 至完全打开弹 簧, 反复 5 次 Open the spring totally by screw driver.repeating 5 times. 将测试产品对插, 至完全插合, 反复插拔 5 次 Plug in the products fully, and plug in & out, 5 times 弹簧打开口、产品对插处均不应出现任何影 响其进一步使用的破损 It cannot has any problems on the spring opening mouth or products itself connecting	详见附件 4 See Appiendix 1	OK
交变盐雾 Alternating	5%的氯化钠溶液 5% sodium chloride, NaCl	详见附件 5 See Appiendix 1	OK

Salt Spray	箱体温度 cabinet temperature: 35℃; PH: 6.5-7.2 严酷等级: 三个喷雾周期, 每个盐雾周期为 2H, 湿热周期为 22H, 24H 为一个周期 测试前后进行接触电阻及动作性能试验 Harsh level : 3 times testing cycle , 2H for the salt spray period , 22H for hot and humidity period , 24H as a cycle , test the contact resistance and action performance before and after it .		
IP 防护等级 IP Protection	IPXX 第一位特征数字: 第二位特征数字: The 1st feature Data : The 2nd feature Data 0 (无防护 No Protection) 0 (无防护 No protection) 1 ≥50mm 直径 Diameter 1 垂直滴水 vertical dropping 2 ≥12.5mm 直径 Diameter 2 滴水(倾斜 15°) Dropping (with 15° angle) 3 ≥2.5mm 直径 Diameter 3 喷雾水 water mist 4 ≥1.0mm 直径 Diameter 4 溅水 splash	IP20	

	5 防尘 dustproof	5 喷水 water spray	
	6 隔尘 Dusttight	6 猛烈喷水 Violent water spray	
		7 短 时 间 浸 水 Water immersion in short time	
		8 连 续 浸 水 continuous flooding	

8. 测试设备 Testing machine

序号 Series No.	设备名称 Machine Name	设备型号 Machine Type	校准时间 Calibration Date	有效日期 Valid Date
1	高低温交变湿热试验箱 High and low temperature alternating damp heat testor	GSJ-100B	2016.6.29	2017.6.28
2	直流低电阻测试仪 DC Low resistance tester	TH2513A	2016.6.29	2017.6.28
3	交流恒流电源 AC constant current power supply	JHL200	2016.6.29	2017.6.28
4	多路温度记录仪 Multi channel temperature recorder	TP9000	2016.6.29	2017.6.28

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5	耐电压测试仪 Withstand voltage tester	WB2670	2016.6.29	2017.6.28
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附件 1Appendix 1

接触电阻 Contact Resistance	产品型号 Type ID	测试结果 Testing Data				
		1	2	3	4	5
高温高湿 测试前 Before the high temperatur e and humidity testing	4501XX/4504XX/060	1.47	1.52	1.51	1.47	1.60
	4251XX/4254XX	1.44	1.53	1.46	1.62	1.63
	4251XX/4252XX	1.51	1.55	1.62	1.66	1.57
	4251XX/4253XX	1.57	1.51	1.62	1.40	1.52
高温高湿 测试后 After the high temperatur e and humidity	4501XX/4504XX/060	1.54	1.60	1.53	1.54	1.61
	4251XX/4254XX	1.47	1.55	1.48	1.62	1.64
	4251XX/4252XX	1.52	1.62	1.66	1.70	1.66
	4251XX/4253XX	1.66	1.62	1.70	1.42	1.55

testing						
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附件 2 Appiendix 2

温升 Temperature Rise	产品型号 Type ID	测试结果 Testingt Result
高温高湿 测试中 During the high temperature and humidity testing	4501XX/4504XX/060	91℃
	4251XX/4254XX	82℃
	4251XX/4252XX	84℃
	4251XX/4253XX	84℃

附件 3 Appiendix 3

耐电压 Withstand Voltage	产品型号 Type ID	测试结果 Testing Data				
		1	2	3	4	5

高温高湿 测试结束前 1-2H 1-2H before the high temperature and humidity testing	4501XX/4504XX/060	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown , no flashover
	4251XX/4254XX	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown , no flashover
	4251XX/4252XX	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown , no flashover
	4251XX/4253XX	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown ,no flashover	无击穿 无闪络 No breakdown n ,no flashover	无击穿 无闪络 No breakdown , no flashover

附件 4 Appendix 4

动作性能 Action Performance	产品型号 Type ID	测试结果 Testing Data	
		弹簧打开口 Spring Open mouth	产品对插处 The points the items plugged in
高温高湿 测试后	4501XX/4504XX/060	完好 Intact	完好 Intact
	4251XX/4254XX	完好 intact	完好 intact

After testing	4251XX/4252XX	完好 intact	完好 intact
	4251XX/4253XX	完好 Intact	完好 intact

附件 5 Appiendix 5

交变盐雾 Alternatibg Salt spray	产品型号 Type ID	测试结果 Testing Data				
		1	2	3	4	5
交变盐雾前 接触电阻 The Contact Resistance before Alternative salt spray testing	4501XX/4504XX/060	1.34	1.34	1.32	1.27	1.29
	4251XX/4254XX	1.44	1.37	1.45	1.31	1.35
	4251XX/4252XX	1.43	1.56	1.42	1.43	1.30
	4251XX/4253XX	1.48	1.49	1.50	1.46	1.47
交变盐雾后 接触电阻 Contact Resistance after	4501XX/4504XX/060	1.64	1.56	1.61	1.57	1.64
	4251XX/4254XX	1.63	1.58	1.63	1.56	1.63
	4251XX/4252XX	1.67	1.72	1.62	1.64	1.52
	4251XX/4253XX	1.62	1.61	1.63	1.59	1.68

Alternative salt spray testing						
交变盐雾前 动作性能 The action performance before Alternative salt spray testing	4501XX/4504XX/060	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact				
	4251XX/4254XX	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact				
	4251XX/4252XX	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact				
	4251XX/4253XX	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact				
交变盐雾后 动作性能 action performance after	4501XX/4504XX/060	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact				
	4251XX/4254XX	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products				



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Alternative salt spray testing		connection point intact
	4251XX/4252XX	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact
	4251XX/4253XX	弹簧打开口完好, 产品对插处完好 The spring open mouth intact, The products connection point intact