

产品可靠度实验报告 Reliability laboratory report of product

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编号: 20190107001

样品品名 Sample Model	光伏连接器 PV connector	样品料号 Part No.	TT02; MC4
样品数量 Sample Q'ty	MC4: 2 sets; TT02: 2 sets。	方法依据 Standard	DIN V VDE V 0126-5(2008)
实验项目 Testing Item	waterproof IP67; 耐压测试; Voltage Withstand Test 整体电阻 Integral resistance ; 拉力测试 Tensile test	实验设备 Testing Equipment	水箱 water tank; 耐压测试仪 Voltage withstanding tester; 低电阻测试仪 low-resistance tester; 拉力测试机 tensile testing machine
送测单位 Prepared By	实验室 laboratory	实验时间 Testing Time	2019-1-7

1. 实验目的(TEST Purpose)

客户使用过程中会出现 TT02与MC4互插的情况, 验证互配现象产品的可靠性。In the process of customer using, TT02 and MC4 will be inserted into each other to verify the reliability of the product interworking.

TT02负极与MC4正极互配

TT02正极与MC4负极互配

TT02 negative and MC4 Positive interworking

TT02 Positive and MC4 negative interworking



2. 实验条件(TEST CONDITION)

IP67水箱: 1米水深; IP67 water tank:depth of water one meter

耐压测试仪: 1000~6000V直流电输出; Voltage withstanding tester:1000~6000V DC OUTPUT

低电阻测试仪: 量程0~20mΩ,精度0.01mΩ; low-resistance tester:measuring range 0~20mΩ,accuracy 0.01mΩ

拉力测试机: 量程0~500N,精度0.01N tensile testing machine:measuring range 0~500N,accuracy 0.01N

3. 实验规格(TEST REQUIREMENT)

A、防水测试标准: 连接器正负对接后沉入1m水箱中30min后, 观察无进水则判定合格。Waterproof test standard: after the connector connected, sink into the 1m depth water tank after 30min, if no water enter,product passed. B、

耐压测试: 连接器用铝箔包裹, 跨接连接在连接器引出线和铝箔间, 增加电压其漏电流增加值 ≤50uA为合格。 Voltage withstanding tester:Connector with aluminum foil wrapped,connection between in connector and aluminum foil, increase the voltage so that leakage current value is less than or equal to 50uA ,product passed.

C、低电阻测试: TT02正负极互配、MC4正负极互配、TT02正极与MC4负极、TT02负极与MC4正极互配后, 测试整体电阻, 电阻值偏差 ≤5%,则判定合格。 low-resistance tester:After TT02 Positive pole and negative pole interworking、MC4 Positive pole and negative pole interworking、TT02 Positive pole and MC4 negative pole interworking、TT02 negative pole and MC4 Positive pole interworking,test the integral resistance,the resistance value deviation is less than 5%,product passed.

D、拉力测试: TT02正负极互配、MC4正负极互配、TT02正极与MC4负极、TT02负极与MC4正极互配后, 导线和连接器的卡接力 ≥320N tension test:After JW Positive pole and negative pole interworking、MC4 Positive pole and negative pole interworking、JW Positive pole and MC4 negative pole interworking、JW negative pole and MC4 Positive pole interworking,wire and connector connecting strength ≥320N,product passed.

4. 样品确认(SAMPLE CHECK)

A、防水测试：TT02正负极互配、MC4正负极互配、TT02正极与MC4负极、TT02负极与MC4正极互组配后的空腔内无水，吸水纸干燥。 Waterproof test standard: After TT02 Positive pole and negative pole interworking、MC4 Positive pole and negative pole interworking、TT02Positive pole and MC4 negative pole interworking、TT02 negative pole and MC4 Positive pole interworking,if no water inside,Absorbent paper drying



TT02正极与MC4负极防水试验结果如上图

TT02 Positive pole and MC4 negative pole waterproof test result as above picture

TT02负极与MC4正极防水试验结果如上图

TT02 negative pole and MC4 Positive pole waterproof test result as above picture

B、耐压测试：漏电流增加值如实验结果中所示，连接器无击穿损坏现象。测试过程中有高压电危险禁止近距离拍摄。Voltage Withstand Test: the leakage current added value same as the result of laboratory show,the connector without breakdown damage.During the test, if have danger of high voltage,pls don't close to take photo.

C、低电阻测试：互配连接器整体电阻测试值0.62~0.63mΩ。

low-resistance tester; connector interworking integral resistance test 0.62~0.63mΩ,



TT02 整体电阻上左图

TT02 integral resistance as above photo



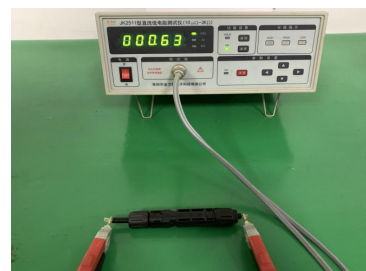
MC4整体电阻上右图

MC4 integral resistance as above photo



TT02正极与MC4负极互配电阻值

TT02 Positive pole and MC4 negative pole resistance value interworking



TT02负极与MC4正极互配电阻值

TT02 negative pole and MC4 Positive pole resistance value interworking

D、拉力测试：连接器与导线的拉力值均大于 320N。Tension test:connector and wire strength value $\geq 320N$

5. 试验结果(TEST RESULTS)

Test Item interworking condition	Waterproof	Voltage Withstand Test	Resistance	Tension	Test Result
TT02 Positive pole and negative pole	No Water	Added value49uA	0.63mΩ	412.66N , TT02 negative pole and wire will break off	passed
MC4 Positive pole and negative pole	No Water	Added value48uA	0.30mΩ	390.46N , MC4 negative pole and wire will break off	passed
T02Positive pole and MC4 Negative po	No Water	Added value48uA	0.31mΩ	380.85N , MC4 negative pole and wire will break off	passed
T02Negative pole and MC4Positive po	No Water	Added value49uA	0.30mΩ	395.67N, MC4 Positive pole and wire will break off	passed

6. 结论(CONCLUSION)

MC4与TT02互配后，进行防水、耐压、电阻、拉力测试。测试结果符合行业标准。After the MC4 and TT02 are interworking,do waterproof, Voltage Withstande, resistance and tension test. The test result all meets the industry standard.



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