



中国认可
国际互认
检测
TESTING
CNAS L0095

Page 1 of 14 Pages
No.: RZUN2018-3119

检测报告

TEST REPORT

UN38.3

NAME OF SAMPLE:

Rechargeable Li-ion Battery

产品名称:

可充电锂离子电池组

CLIENT:

Springpower Technology (Shenzhen) Co., Ltd.

委托单位:

曙鹏科技（深圳）有限公司

CLASSIFICATION OF TEST:

Commission Test

检测类别:

委托测试

威凯检测技术有限公司
Vkan Certification & Testing Co., Ltd.



检测报告

TEST REPORT

No.:RZUN2018-3119

Page 2 of 14 Pages

Name of samples: Rechargeable Li-ion Battery 样品名称:可充电锂离子电池组	Type/Model: 型号规格: P80 3.8V 8000mAh 30,4Wh
Appearance: Silver 样品外观颜色:银色	Trade mark: 商标: -
Commissioned by: Springpower Technology (Shenzhen) Co., Ltd. 委托单位: 曙鹏科技(深圳)有限公司	Manufacturer: Springpower Technology (Shenzhen) Co., Ltd. 生产单位: 曙鹏科技(深圳)有限公司
Commissioner address:101,No.2, Chaoshun Industrial Zone, Fumin Community, Fucheng Street, Longhua District, Shenzhen City, Guangdong Province, P. R. China. 委托单位地址:中国广东省深圳市龙华区福城街道福民社区超顺工业区 2 号 101	Manufacturer address:101,No.2, Chaoshun Industrial Zone, Fumin Community, Fucheng Street, Longhua District, Shenzhen City, Guangdong Province, P. R. China. 生产单位地址: 中国广东省深圳市龙华区福城街道福民社区超顺工业区 2 号 101
Classification of test: Commission Test 检测类别: 委托测试	Quantity of sample: 8 battery packs, 25 cells 样品数量: 8 个电池组, 25 个电芯
Tested according to: 测试标准: ST/SG/AC.10/11/Rev.6/Section 38.3	Sample identification: 样品标识序号:b1#~b8#, c1#~c25#
Receiving date: 接样日期: 2018-11-12	Means of receiving: Submitted by commissioner 接样方式: 委托单位送样
Completing date: 完成日期: 2018-12-06	Test item: 8 items 测试项目: 8 项
Test conclusion: 检测结论: <p>The Rechargeable Li-ion batteries submitted by Springpower Technology (Shenzhen) Co., Ltd. are tested according to Section 38.3 of the sixth Revised Edition of the Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6 Section 38.3). The test items are full items. The test results comply with the relevant requirements of the standard.</p> <p>由曙鹏科技(深圳)有限公司送检的可充电锂离子电池组, 依据《关于危险货物运输的建议书》试验和标准手册第六修订版第 38.3 节进行检测, 试验为全项目, 测试结果符合标准相关要求。</p> <div style="text-align: center;">  <p>Seal of CVC CVC 印章 Date of issue: 2018.12.6 检验检测专用章</p> </div>	

Approved by:

Reviewed by:

Tested by:

批准:

Lin Guang

审核:

Zhang Siyao

检测:

Wei Guohua

Description and illustration of the sample:

样品说明及描述:

The sample's status is good

样品状况良好。

Test item 测试项目	Sample No. 样品编号	State 状态	Remark 备注
T.1~T.5	b1#~b4#	at first cycle, in fully charged state 第一个交替充电放电周期完全充电状态	-
	b5#~b8#	at fifty cycle, in fully charged state 第五十个交替充电放电周期完全充电状态	
T.6	c1#~c5#	at first cycle at 50% of the design rated capacity 第一个交替充电放电周期充电到设计额定容量的 50%	-
T.7	b1#~b4#	at first cycle, in fully charged state 第一个交替充电放电周期完全充电状态	using undamaged samples previously used in tests T.1 to T.5 使用试验 T.1 至 T.5 未损坏的样品
	b5#~b8#	at fifty cycle, in fully charged state 第五十个交替充电放电周期完全充电状态	
T.8	c6#~c15#	at first cycle, in fully discharged state 第一个交替充电放电周期完全放电状态	-
	c16#~c25#	after fifty cycles ending in fully discharged state 第五十个交替充电放电周期完全放电状态	-

Description of the sampling procedure:

取样程序的说明:

/

Description of the deviation from the standard, if any:

测试结果不符合标准项的说明:

/

Remarks:

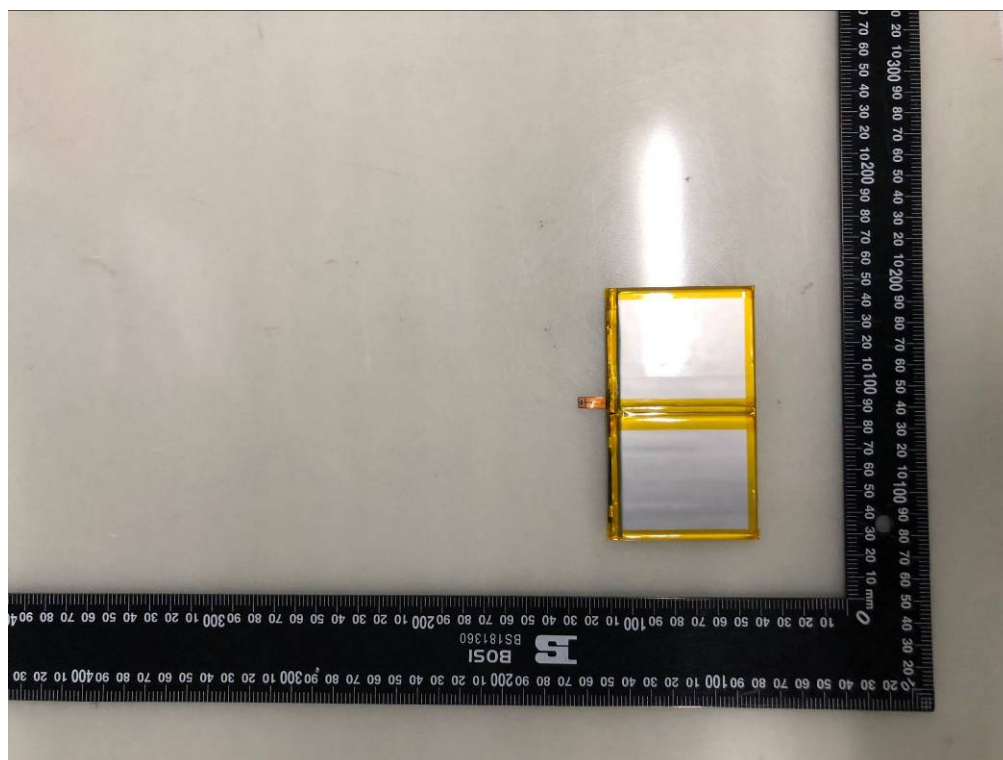
备注:

Throughout this report a comma is used as the decimal separator.

本报告中以逗号代替小数点。

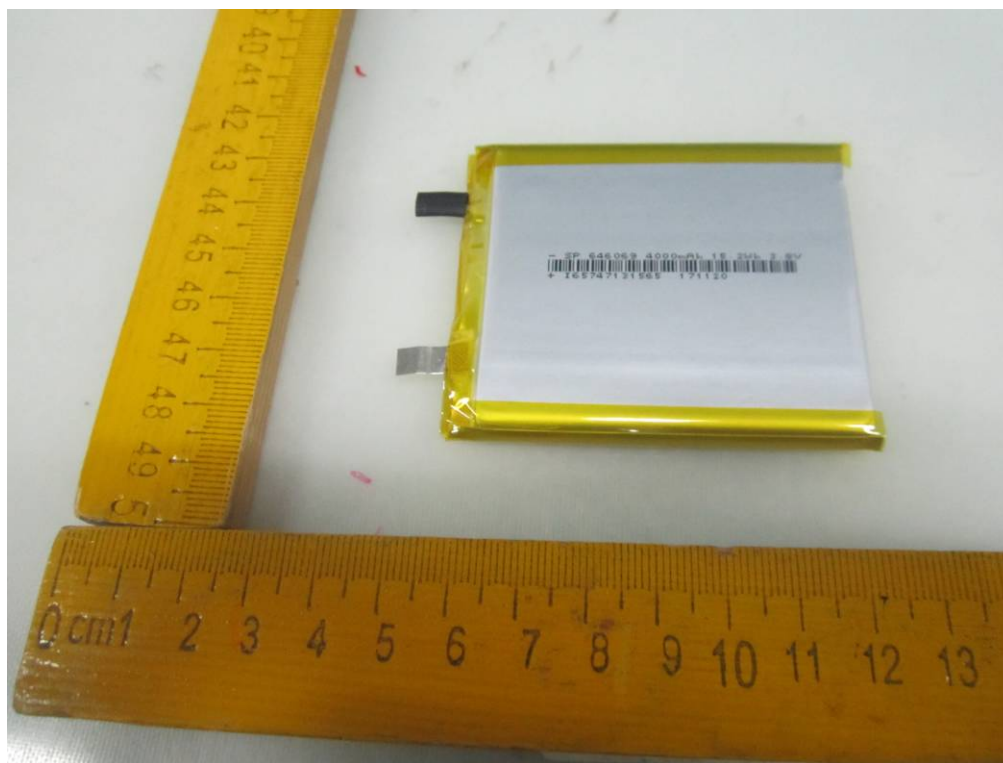
Photos of Samples and Labels/样品照片及标识

Battery/电池 (P80 3,8V 8000mAh 30,4Wh)



Photos of Samples and Labels/样品照片及标识

Inner Cell/内部电芯 (SP 646069 3,8V 4000mAh)



ST/SG/AC.10/11/Rev.6/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4	Procedure/测试步骤		—
38.3.4.1	Test 1: Altitude simulation/测试 1: 高度模拟		P
	<p>Test cells and batteries shall be stored at a pressure of 11,6kPa or less for at least six hour at ambient temperature (20±5℃)/ 将电芯和电池在温度为 20±5℃, 大气压力为不大于 11,6kpa 的环境中贮存不少于 6 个小时</p> <p>Requirement/标准要求:</p> <p>1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%</p> <p>2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%, 此要求不适用于完全放完电的电池和电芯。</p> <p>3 No leakage, no venting, no disassembly, no rupture and no fire 样品(电池)应无漏液、无排气、无解体、无破裂以及无着火现象的发生</p>	<p>The samples b1#~b8# : No leakage, no venting, no disassembly, no rupture and no fire/编号为 b1#~b8#的样品: 无漏液、无排气、无解体、无破裂以及无着火现象</p> <p>The data see table1/数据见表 1</p>	
38.3.4.2	Test 2: Thermal test/测试 2: 热冲击		P
	<p>Test cells and batteries are to be stored for/电池存储条件如下:</p> <p>1 one temperature cycle: 72±2℃(6h) —40±2℃(6h) /一次温度循环为 72±2℃(6h) —40±2℃(6h)</p> <p>2 The maximum time interval between test temperature extremes is 30 minutes/温度转换最大间隔时间为 30min</p> <p>3 This procedure is to be repeated 10 times/重复 10 次循环</p> <p>4 after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5℃)/循环结束后, 电池在 20±5℃的条件下 搁置 24 小时.</p> <p>Requirements/标准要求</p> <p>1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%</p> <p>2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%, 此要求不适用于完全放完电的电池和电芯。</p> <p>3 No leakage, no venting, no disassembly, no rupture and no fire 样品(电池)应无漏液、无排气、无解体、无破裂以及无着火现象的发生</p>	<p>The samples b1#~b8# : No leakage, no venting, no disassembly, no rupture and no fire/编号为 b1#~b8#的样品: 无漏液、无排气、无解体、无破裂以及无着火现象</p> <p>The data see table1/数据见表 1</p>	

ST/SG/AC.10/11/Rev.6/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4.4	Test 4: Shock/测试 4: 冲击 1 Test cells and batteries shall be secured to the testing machine/以稳固的托架固定住每个电芯和电池样品的全部配件表面。2 Each cell shall be subjected to a half-sine shock of peak acceleration of 150 g _n and pulse duration of 6 milliseconds. Large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds. / 对每个电芯以峰值为 150g _n 的半正弦的加速度撞击, 脉冲持续 6 毫秒, 大型电芯须经受最大加速度 50g _n 和脉冲持续时间 11 毫秒的半正弦波冲击。Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g _n (or Acceleration(g _n)= $\sqrt{(10085Q/mass)}$, which is smaller) and pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak acceleration of 50 g _n (or Acceleration(g _n)= $\sqrt{(3000Q/mass)}$, which is smaller) and pulse duration of 11 milliseconds/对每个电池以峰值为 150g _n (或与 $\sqrt{(10085Q/mass)}$ 中的较小值) 的半正弦的加速度撞击, 脉冲持续 6 毫秒, 大型电池组须经受最大加速度 50g _n (或与 $\sqrt{(3000Q/mass)}$ 中的较小值) 和脉冲持续时间 11 毫秒的半正弦波冲击。3 Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks/每个电池或电池组须在三个互相垂直的电池安装方位的正方向经受三次冲击, 接着在反方向经受三次冲击, 总共经受 18 次冲击。		P
	Requirements/标准要求: 1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1% 2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90 %, 此要求不适用于完全放完电的电池和电芯。 3 No leakage, no venting, no disassembly, no rupture and no fire 样品 (电池) 应无漏液、无排气、无解体、无破裂以及无着火现象的发生	The samples b1#~b8# : Acceleration=150g _n No leakage, no venting, no disassembly, no rupture and no fire/编号为 b1#~b8#的样品: 峰值加速度=150g _n 无漏液、无排气、无解体、无破裂以及无着火现象 The data see table1/数据见表 1	
38.3.4.5	Test 5: External Short Circuit/测试 5 外接短路 1 The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 57±4℃/保持试验环境温度稳定在 57±4℃, 以使电芯或电池样品外表温度达到 57±4℃ 2 the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0,1 ohm at 57±4℃, This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value. /将样品正负极用小于 0,1Ω 的总电阻回路进行短路, 样品的外表温度恢复到 57±4℃之后保持短路状态 1 小时以上; 对于大电池, 电池温度降低至最高温升值的一半时实验结束。 3 the cell or battery must be observed for a further six hour for the test to be concluded, /对电芯或电池必须进一步观察 6 个小时才能下结论。		P
	Requirements/标准要求: During the test and within six hours after test ,the cells or batteries 在测试过程中以及之后 6 个小时内, 电芯或电池样品 1. External temperature not exceed 170℃ 外表温度不超过 170℃ 2. No disassembly, no rupture and no fire.	The samples b1#~b8# : no disassembly, no rupture and no fire/编号为 b1#~b8#的样品: 无解体、无破裂以及无着火现象 The data see table1/数据见表 1	

ST/SG/AC.10/11/Rev.6/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
	无解体、无破裂和无着火现象发生。		

ST/SG/AC.10/11/Rev.6/Section 38.3

Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4.7	Test 7: Overcharge/测试 7: 过充电		P
	1 The charge current shall be twice the manufacturer's recommended maximum continuous charge current/以 2 倍制造厂推荐的最大持续充电电流对样品充电 2 The minimum voltage of the test shall be as follows/本测试最小电压为:		
	a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V/ 如果厂家推荐的充电电压不超过 18V, 本测试的最小充电电压应是厂家标定最大充电电压的两倍或者是 22V 之中的较小者。 b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1,2 times the maximum charge voltage/ 如果厂家推荐的充电电压超过 18V, 本测试的最小充电电压应是厂家标定最大充电电压的 1,2 倍。 3 Tests are to be conducted at ambient temperature 20±5℃, The duration of the test shall be 24 hours/20±5℃的环境温度下, 试验持续 24 小时。	The voltage of the test is 8,8V, and the current is 8A 测试的电压为 8,8V, 电流为 8A	
	Requirements/标准要求: No disassembly and no fire within seven days of this test 试验样品在试验中和试验后 7 天内, 应无解体和无着火现象发生。	The samples b1#~b8# : For voltage data before test, see table 3. / 试验前电压见表 3 no disassembly, no rupture and no fire/编号为 b1#~b8# 的样品: 无解体、无着火现象	
38.3.4.8	Test 8: Forced discharge/测试 8: 强制放电		P
	Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer, 20±5℃的环境温度下, 将单个电芯连接在 12V 的直流电源上进行强制放电, 此直流电源提供给每个电芯初始电流为制造厂指定的最大放电电流。		
	The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere) 指定的放电电流通过串联在测试电芯上的合适大小和功率的负载来获得, 每个电芯的强制放电时间 (小时) 为额定容量除以初始电流 (安培)。		
	Requirements/标准要求: No disassembly and no fire within seven days of this test 试验样品在试验中和试验后 7 天内, 应无解体和无着火现象发生。	c6#~c25# For voltage data before test, see table 4. / 试验前电压见表 4 No disassembly and no fire / 无解体、无着火现象	

Table1: T1~T5 / 表 1. 试验 1~试验 5

Sample No. 样品号	Mass prior to test / 试验前质量 (g)	OCV prior to test / 试验前电压(V)	Test 1: Altitude simulation/ 测试 1: 高度模拟		Test 2: Thermal test/ 测试 2: 热冲击		Test 3: Vibration/ 测试 3: 振动		Test 4: Shock/ 测试 4: 冲击		Test 5: External Short Circuit/测试 5 外接短路
			Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Temp. (°C) 温度 (°C)
b1#	118,556	4,325	0,000	100,00	0,002	97,66	0,000	100,00	0,000	100,00	57,8
b2#	118,703	4,326	0,000	100,00	0,002	97,67	0,000	100,00	0,000	100,00	57,5
b3#	118,322	4,325	0,000	100,00	0,001	97,66	0,000	100,00	0,000	100,00	57,6
b4#	118,256	4,325	0,000	100,00	0,001	97,71	0,000	100,00	0,000	100,00	57,3
b5#	118,277	4,324	0,000	100,00	0,002	97,69	0,000	100,00	0,000	100,00	57,1
b6#	118,326	4,325	0,000	100,00	0,001	97,69	0,000	100,00	0,000	100,00	57,7
b7#	118,644	4,324	0,000	100,00	0,003	97,66	0,000	100,00	0,000	100,00	57,4
b8#	118,444	4,325	0,000	100,00	0,003	97,64	0,000	100,00	0,000	100,00	57,0

Table2: Crush / 表 2: 挤压						
Test 6: Crush/测试 6: 挤压	Sample No. 样品号	c1#	c2#	c3#	c4#	c5#
	OCV prior to test / 试验前电压 (V)	3,888	3,872	3,886	3,864	3,867
	Temp. (°C) 温度 (°C)	27,8	28,6	28,3	27,9	28,4

Table3: Overcharge Test of batteries/ 表 3 电池过充试验									
Test 7: Overcharge /测试 7: 过充电	Sample No. 样品号	b1#	b2#	b3#	b4#	b5#	b6#	b7#	b8#
	OCV prior to test /试 验前电压 (V)	4,224	4,225	4,224	4,226	4,220	4,225	4,223	4,223

Table 4: Forced discharge / 表 4. 强制放电											
Test 8: Forced discharge / 测试 8: 强 制放电	Sample No. 样品号	c6#	c7#	c8#	c9#	c10#	c11#	c12#	c13#	c14#	c15#
	OCV prior to test / 试验前电压(V)	3,368	3,372	3,367	3,370	3,371	3,367	3,366	3,370	3,368	3,367
	Sample No. 样品号	c16#	c17#	c18#	c19#	c20#	c21#	c22#	c23#	c24#	c25#
	OCV prior to test / 试验前电压(V)	3,368	3,372	3,372	3,373	3,372	3,369	3,371	3,371	3,372	3,372

注 意 事 项 Important

1. 本报告无检测单位印章无效。
The test report is invalid without the official stamp of CVC.
2. 未经本试验室书面同意，不得部分地复制本报告。
Nobody is allowed to photocopy or partly photocopy this test report without written permission of CVC.
3. 本报告无批准人、审核人及检测人签名无效。
The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
4. 本报告涂改无效。
The test report is invalid if altered,
5. 对检测报告若有异议，应于收到报告之日起十五天内向检测单位提出。
Objections to the test report must be submitted to CVC within 15 days,
6. 本报告仅对送检样品负责。
The test report is valid for the tested samples only.
7. 判定栏中“-”表示“不需要判定”，“P”表示“通过”，“F”表示“不通过”，“N/A”表示“不适用”。
As for the Verdict, “-” means “no need for judgement”, “P” means “pass”, “F” means “fail” and “N/A” means “not applicable”.

地 址：中国 广州市科学城开泰大道天泰一路 3 号

Address: No.3,Tiantaiyi Road,Kaitai Avenue,Science City,Guangzhou P. R. China.

电 话(Tel): 020 32293888

传 真(FAX): 020 32293889

邮政编码(Post Code): 510663

E-mail: office@cvc.org.cn

<http://www.cvc.org.cn>