TEST REPORT

报告编号 **Reference No.**	:	WTD18S11130108-1B
申请商 **Applicant**	:	深圳宏赛能源有限公司 **Shenzhen Honcell Energy Co., Ltd.**
申请商地址 **Address**	:	深圳市龙华新区梅龙大道 194 号卫东龙商务大厦 A 座 612 **612, Bldg. A, Weidonglong Industrial Zone, Meilong Ave.194#, Longhua New District, Shenzhen, 518109, China.**
制造商 **Manufacturer**	:	深圳宏赛能源有限公司 **Shenzhen Honcell Energy Co., Ltd.**
制造商地址 **Address**	:	深圳市龙华新区梅龙大道 194 号卫东龙商务大厦 A 座 612 **612, Bldg. A, Weidonglong Industrial Zone, Meilong Ave.194#, Longhua New District, Shenzhen, 518109, China.**
产品名称 **Name of product**	:	锂离子聚合物电池 Lithium-ion polymer battery
产品型号 **Model**	:	HCP602535PFC
总共页数 **Total pages**	:	16 pages
依据标准 **Standards**	:	关于危险品货物运输的建议书 试验和标准手册 第六修订版 第 38.3 节 Section 38.3 of the Sixth revised edition of Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11Rev.6 Section 38.3)
发布日期 **Date of Issue**	:	2018-11-27
测试结果 **Test Result**	:	所提供的样品符合以上测试标准 The submitted samples comply with the above standards

备注：此报告中出示的结果仅对测试样品负责；未经本公司书面批准，不得复制本报告；本报告经测试机构编辑者签名和批准人签名并加盖本公司公章后方有效。
Remarks:The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:
Waltek Services (Shenzhen) Co., Ltd.
Address: 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen Guangdong, China
Tel:+86-755-83551033
Fax:+86-755-83552400

编辑 Complied by:

苏永全 Mike Su /工程师 Project Engineer

批准 Approved by:

钟明 Philo Zhong / 总经理 Manager

产品一般信息 General product information:	
产品分类 /Classification .....:	锂离子聚合物电池 Lithium-ion polymer battery
型号 /Model .....:	HCP602535PFC
额定值/Ratings .....:	3.7V, 500mAh, 1.85Wh
商标/Trade mark.....	/
最大充电电压/Max. charge voltage .....:	4.2V
最大充电电流/Max. charge current .....:	500mA
标准充电电流/Standard charge current .....:	100mA
最大放电电流/Max. discharge current .....:	500mA
标准放电电流/Standard discharge current .....:	100mA
放电截止电压/Discharge cut-off voltage .....:	3.0V
尺寸/Dimension .....:	35.5x25.3x5.6mm
报告中可能用到的结论标识 Possible test case verdicts:	
测试项目不适用该产品 test case does not apply to the test object	不适用 N/A
测试项目符合标准的要求 test object does meet the requirement	合格 P(ass)
测试项目不符合标准的要求 test object does not meet the requirement	不合格 F(ail)
测试 Testing:	
样品接受日期 Date of receipt of test item	2018-08-15
测试日期 Date(s) of performance of test	2018-08-16 to 2018-08-31
测试结论 Test Conclusion:	
测试根据标准《关于危险品货物运输的建议书 试验和标准手册》第六修订版 第 38.3 节 (ST/SG/AC.10/11Rev.6 Section 38.3)进行 测试结果： 合格 The Battery are tested according to Section 38.3 of the Sixth revised edition of Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6). Test Result: Pass.	

测试项目 Test itel	样品 Sample	样品状态 Samples' State
T.1 高空模拟 Altitude simulation	B01#-B10#	一次循环充放电完全充电状态 At first cycle, in fully charged state
T2.温度试验 Thermal test		
T3.振动 Vibration		
T4.冲击 Shock		
T5. 外部短路 External short circuit		
T.6 撞击/挤压 Impact / Crush	C01#-C05#	一次充电放电周期 50%设计标定电容量状态 At first cycle at 50% of the design rated capacity
T.7 过充 Overcharge	B11#-B14#	一次循环充放电完全充电状态 At first cycle, in fully charged state
	B15#-B18#	五十个交替充电放电周期后完全充电状态 After fifty cycles ending in fully charged state
T.8 强制放电 Forced discharge	C06#-C15#	一次充电放电周期完全放电状态 At first cycle, in fully discharged state
	C16#-C25#	五十个充电放电周期后完全放电状态 After fifty cycles ending in fully discharged state

备注：

测试环境条件，环境温度 20℃-25℃，环境湿度：45%-75%

分包测试：不适用

Remarks:

Test environment condition, ambient temperature 20℃-25℃, ambient humidity 45%-75%

Subcontracted test condition：N/A

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
38.3.4	**程序 /Procedure**		**P**
	小型电芯或电池必须按顺序进行试验 1 至 5。/Test T.1 to T.5 shall be conducted in sequence on the same cell or battery.		P
	试验 6 和 8 应使用未另外试验过的电芯或电池/Test T.6 and T.8 shall be conducted using not otherwise tested cells or batteries.		P
	试验 7 使用原先在试验 1 至 5 中使用过的未损坏电池进行/Test T.7 may be conducted using undamaged batteries previously used in Tests T.1 to T.5 for purposes of testing on cycled batteries.		N/A
质量损失 **Mass loss**	用以下测试步骤 Following procedure is provided:		P
	质量损失（%）=（M1-M2）/M1*100 此式中 M1 是试验前的质量，M2 是试验后的质量。如果质量损失不超过下表所列的数值，即为“无质量损失” Mass loss(%)=(M1-M2)/M1*100 Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in below table, it shall be considered as “no mass loss”		--
	电芯或电池质量 M Mass M of cell or battery / 质量损失限制 Mass loss limit M<1g / 0.5% 1g≤M≤75g / 0.2% M>75g / 0.1%		--
38.3.4.1	**试验 T.1： 高度模拟 /Test T.1: Altitude Simulation**		**P**
38.3.4.1.1	目的/Purpose		P
	本试验模拟在低压条件下的空运/This test simulates air transport under low-pressure conditions.		--
38.3.4.1.2	试验程序/Test procedure		P
	存储气压/Stored at a pressure	11.6 kPa	--
	环境温度/Ambient temperature (20 ± 5℃)	23.8℃	--
	存储时间/Stored times(≥ 6 hours)	6 hours	--
38.3.4.1.3	要求/Requirement		P
	无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%,电压的要求不适用与完全放电状态的试验电芯和电池 / No leakage, no venting, no disassembly, no rupture and no fire and the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火，数据见表 1 / No leakage, no venting, no disassembly, no rupture and no fire. The data see Table 1	P

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
38.3.4.2	**试验 2 温度试验/ Test T.2: Thermal Test**		**P**
38.3.4.2.1	目的/Purpose		--
	本试验评估电芯和电池的密封完善性和内部电连接，试验是利用迅速和极端的温度变化进行/This test assesses cell and battery seal integrity and internal electrical connections. The test is conducted using rapid and extreme temperature changes.		--
38.3.4.2.2	试验程序/Test procedure		P
	试验温度和存储时间/ Test temperature and stored hours	1) 72±2℃, ≥6h 2) -40±2℃, ≥6h	--
	两个极端试验温度的最大间隔时间/The maximum time interval	极端温度之间间隔时间≤30min /Between test temperature extremes is ≤30 minutes.	--
	测试时间/ Test times	重复 10 次/Repeated 10 times	--
	所有电芯或电池在环境温度(20±5℃)下存放 24 小/After which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5℃).	环境温度/ Ambient temperature 24.0℃	--
	对于大型电芯或电池，暴露于极端试验温度的时间至少应为 12 小时/For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours	小型电池/ Small battery	N/A
38.3.4.2.3	要求/Requirement		P
	无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%,电压的要求不适用与完全放电状态的试验电芯和电池 / No leakage, no venting, no disassembly, no rupture and no fire and the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火；数据见表 2/ No leakage, no venting, no disassembly, no rupture and no fire. The data see Table 2	P

38.3.4.3	**试验 3 振动 /Test T.3: Vibration**		**P**
38.3.4.3.1	目的/ Purpose		P
	本试验模拟运输过程中的振动/This test simulates vibration during transport.		--
38.3.4.3.2	测试程序/ Test procedure		P
	电芯和电池以不使电芯变形且能正确地传播振动的方式紧固在振动机平面上/ Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration.		P

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
	振动应以正弦波形振动，频率在 7Hz 和 200Hz 之间摆动再回到 7Hz 的对数扫频为时 15min/ The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7Hz and 200Hz and back to 7Hz traversed in 15minutes.		P
	从 7HZ 开始保持 1 g_n 的最大加速度直到频率达到 18HZ, 然后将振幅保持在 0.8mm(总偏移 1.6mm)并增加频率直到最大加速度达到 8 g_n (频率约为 50HZ)。将最大加速度保持在 8 g_n 直到频率增加到 200HZ /From 7 Hz to a peak acceleration of 1 g_n is maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8 g_n occurs (approximately 50 Hz). A peak acceleration of 8 g_n is then maintained until the frequency is increased to 200 Hz		P
	振动须对三个互相垂直的电池安装方位的每一方向都重复进行 12 次，总共 3 小时。其中一个方向必须与端面垂直/This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.		P
38.3.4.3.3	要求/ Requirement		P
	试验中和试验后无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或电池在第三个垂直安装方位上的试验后的立即测得开路电压不小于其在进行这一试验前电压的 90%,电压的要求不适用与完全放电状态的试验电芯和电池/No leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火，数据见表 3/ No leakage, no venting, no disassembly, no rupture and no fire during the test .The data see Table 3	P

38.3.4.4	**试验 4 冲击/ Test T.4: Shock**		**P**
38.3.4.4.1	目的/ Purpose		P
	本试验评估电池和电芯抵抗累计冲击的稳健性/This test assesses the robustness of cells and batteries against cumulative shocks		--
38.3.4.4.2	测试程序 /Test procedure		P
	试验电芯和电池用坚硬的支架固定在试验装置上，支架支撑着每个试验电池的所有安装面;/Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery.		P

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
	电芯经受峰值加速度 150 g_n 和脉冲持续时间 6ms 的半正弦波冲击/Each cell shall be subjected to a half-sine shock of peak acceleration of 150 g_n and pulse duration of 6milliseconds.		P
	大电芯需经受峰值加速度 50 g_n 和脉冲持续时间 11ms 的半正弦波冲击/Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50 g_n and pulse duration of 11 milliseconds.		N/A
	每个电池需经受半正弦波冲击的峰值加速度取决于电池的质量。小型电池的脉冲持续时间为 6ms,大型电池为 11ms。以下提供的公式用来计算适合的最小峰值加速度/Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provide to calculate the appropriate minimum peak accelerations.		N/A
	Battery: Small batteries; Minimum peak acceleration: 150 g_n or result of formula $Acceleration(g_n)=\sqrt{(\frac{100850}{mass^*})}$ Whicheve is smaller; Pulse duration: 6ms Battery: Large batteries; Minimum peak acceleration: 50 g_n or result of formula $Acceleration(g_n)=\sqrt{(\frac{30000}{mass^*})}$ Whichever is smaller; Pulse duration: 11ms		N/A
	每个电芯或电池须在三个互相垂直的电芯安装方位的正方向经受三次冲击，接着反方向经受三次冲击，总共经受 18 次冲击/Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.		P
38.3.4.4.3	要求/Requirement		P
	无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或电池在试验后的开路电压不小于其在进行这一试验前电压的 90%，电压的要求不适用与完全放电状态的试验电芯和电池/No leakage, no venting, no disassembly, no rupture and no fire and the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂和无起火，数据见表 4 /No leakage, no venting, no disassembly, no rupture and no fire. The data see Table 4	P

38.3.4.5	**试验 5 外部短路 /Test T.5: External Short Circuit**		**P**
38.3.4.5.1	目的/ Purpose		P
	本试验模拟外部短路/This test simulates an external short circuit.		--

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
38.3.4.5.2	试验程序 /Test procedure		P
	电芯或电池须加热一段时间并且外壳稳定在温度 57±4℃下后开始测试。根据电芯或电池的尺寸，评估和记录加热时间。如果此评估值不可行，小型电芯或电池需至少 6h,大电芯或电池需 12h//The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature 57±4℃, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries.		P
	在 57±4℃温度下，电芯或电池需经受外部电阻 0.1ohm 的短路试验/Then the cell or battery at 57±4℃ shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.	0.086 ohm	P
	电芯或电池外部壳体温度恢复到 57±4℃后，短路需持续至少 1 小时，或大型电池，壳体温度值下降测试中最大温升的一半，并且保持在这个值以下/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.		P
38.3.4.5.3	要求/ Requirement		P
	外壳温度不超过 170℃，并且在试验过程中及试验后 6 小时内无解体、无破裂、无起火 Cells and batteries external temperature does not exceed 170℃ and there is no disassembly, no rupture and no fire during the test and within six hours after this test.	试验过程中及试验后 6 小时内无解体、无破裂、无起火，数据见表 5/No disassembly, no fire during the test and within six hours after this test. The data see Table 5.	P

38.3.4.6	**试验 6 撞击/挤压 Test T.6: Impact / Crush**		**P**
38.3.4.6.1	目的 /Purpose		P
	本试验模拟撞击或挤压等可能造成内部短路的机械性破坏/These tests simulate mechanical abuse from an impact or crush that may result in an internal short circuit.		--
38.3.4.6.2	**试验程序-撞击**（适用于直径不小于18毫米的圆柱形电芯）/Test procedure – Impact (applicable to cylindrical cells not less than 18.0 mm in diameter)	Cylindrical cells not less than 18.0 mm in diameter	N/A
	将式样电池或元件电芯放在平坦光滑的表面上。一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 mm ± 0.1mm,长度至少 6cm，或电池最长端的尺度，取二者之长者。将一块 9.1 kg ±0.1kg 的重锤从 61 ± 2.5cm 高处		N/A

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
	跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的，对落体重锤阻力最小的垂直轨道或管道加以控制。垂直管道或管道用于引导落锤沿与水平支撑表面呈 90°落下/The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg ± 0.1 kg mass is to be dropped from a height of 61 ± 2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.		
	接受撞击的试样，纵轴应与平坦表面平行并与横放在试样中心的直径 15.8 mm ± 0.1mm 弯曲表面的纵轴垂直;每一个试样只经受一次撞击/The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.		N/A
38.3.4.6.3	**试验程序-挤压**（适用于棱柱形、袋装、硬币/纽扣电芯和直径小于18mm的圆柱形电芯）/Test Procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)		P
	将电池或元件电芯放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约 1.5cm/s。挤压持续进行，直到出现三种情况之一：/A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached.		P
	施加的力量达到 13 kN ± 0.78KN The applied force reaches 13 kN ± 0.78 kN;	☒Reach this condition	P
	电池的电压下降至少 100mV The voltage of the cell drops by at least 100 mV;	☐Reach this condition	N/A
	电池变形达原始厚度的 50%或以上/The cell is deformed by 50% or more of its original thickness.	☐Reach this condition	N/A
	每个测试的电池或元件电芯只做一次挤压试验/Each test cell or component cell is to be subjected to one crush only.		P
	试验样品需观察 6 小时/The test samples shall be observed for a further 6h		P
	试验应使用之前未做过其他试验的电池或元件电芯进行/The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.		P
38.3.4.6.4	要求/ Requirement		P

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
	外壳温度不超过 170 °C，并且在试验过程中及试验后 6 小时内无解体、无破裂、无起火/Cells and component cells meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly and no fire during the test and within six hours after this test.	在试验过程中及试验后 6 小时内无解体、无破裂、无起火;数据见表 6 /No disassembly and no fire during the test and within six hours after this test. The data see Table 6	P
38.3.4.7	**试验 7 过度充电 /Test T.7: Overcharge**		**P**
38.3.4.7.1	目的 /Purpose		P
	本试验评估可充电电池承受过度充电状况的能力/This test evaluates the ability of a rechargeable battery to withstand an overcharge condition.		--
38.3.4.7.2	试验程序/Test procedure		P
	充电电流必须是制造商建议的最大持续充电电流的两倍 The charge current shall be twice the manufacturer's recommended maximum continuous charge current.	500*2=1000mA	P
	试验的最小电压如下：/The minimum voltage of the test shall be as follows:		P
	a)制造商建议的充电电压不大于 18V 时，试验的最小电压是电池最大充电电压的两倍或 22V 两者中的较小者 /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.	8.4V	P
	b) 制造商建议的充电电压大于 18V 时，试验的最小电压应为最大充电电压的 1.2 倍/When the manufacturer's recommended charge voltage is not more than 18V,the minimum voltage of the test shall be 1.2 times the maximum charge voltage.		N/A
	试验环境温度/ Ambient temperature.	24.1℃	--
	试验的进行时间/ The duration of the test.	24h	--
38.3.4.7.3	要求 /Requirement		P
	充电电池在试验过程中和试验后 7 天内无解体，无起火 /Rechargeable battery is no disassembly and no fire during the test and within seven days after the test.		P
38.3.4.8	**试验 8 强制放电 Test 8: Forced discharge**		**P**
38.3.4.8.1	目的 Purpose		P
	本试验评估原电池或充电电池承受强制放电状况的能力 /This test evaluates the ability of a primary or a rechargeable cell to withstand a forced discharge condition.		--
38.3.4.8.2	试验程序 Test procedure		P
	每个电池应在环境温度下与 12V 直流电电源串联和起始电流等于制造商给定的最大放电电流的条件强制放 /Each cell shall be forced discharged at ambient		P

ST/SG/AC.10/11Rev.6 Section 38.3			
条款 Clause	测试要求 Requirement-Test	结果评判 Result-Remark	结论 Verdict
	temperature by connecting it in series with a 12 V DC, power supply at an initial current equal to the maximum discharge current specified by the manufacturer.		
	将适当大小和额定值的电阻负荷与试验电池串联，计算得给定的放电电流。对每个电池进行强制放电，放电时间（小时）应等于其额定容量除以初始试验电流（安培）/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).		P
38.3.4.8.3	要求/Requirement		P
	原电池或充电电池在试验过程中和试验后 7 天内无解体，无起火/Primary or rechargeable cells is no disassembly and no fire during the test within seven days after the test.	试验过程中和试验后 7 天内无解体，无起火;数据见表 8/There is no disassembly and no fire during the test within seven days after the test. The data see Table 8	P

表 1：高空模拟/ Table1: Altitude simulation

编号/ No.	质量/Mass(g)			电压/Voltage(V)			判定/ Verdict
	试验前 M1 /Before test M1	试验后 M2 /After test M2	质量损失 /Mss loss (%)	试验前 OCV1 /Before test OCV1	试验后 OCV2 /After test OCV2	OCV2/OCV1 (%)	
B01#	9.896	9.894	0.020	4.194	4.192	99.95	P
B02#	9.972	9.972	0.000	4.192	4.191	99.98	P
B03#	9.978	9.977	0.010	4.196	4.194	99.95	P
B04#	9.979	9.978	0.010	4.195	4.194	99.98	P
B05#	9.851	9.851	0.000	4.198	4.196	99.95	P
B06#	9.954	9.954	0.000	4.189	4.187	99.95	P
B07#	9.871	9.869	0.020	4.196	4.194	99.95	P
B08#	9.855	9.855	0.000	4.193	4.191	99.95	P
B09#	9.868	9.867	0.010	4.191	4.190	99.98	P
B10#	9.957	9.956	0.010	4.195	4.193	99.95	P

表 2： 温度测试/ Table 2: Thermal test

编号/ No.	质量/Mass(g)			电压/Voltage(V)			判定 /Verdict
	试验前 M1 /Before test M1	试验后 M2 /After test M2	质量损失 /Mss loss (%)	试验前 OCV1 /Before test OCV1	试验后 OCV2 /After test OCV2	OCV2/OCV1 (%)	
B01#	9.894	9.888	0.061	4.192	4.160	99.24	P
B02#	9.972	9.965	0.070	4.191	4.152	99.07	P
B03#	9.977	9.973	0.040	4.194	4.161	99.21	P
B04#	9.978	9.972	0.060	4.194	4.161	99.21	P
B05#	9.851	9.845	0.061	4.196	4.169	99.36	P
B06#	9.954	9.948	0.060	4.187	4.165	99.47	P
B07#	9.869	9.864	0.051	4.194	4.162	99.24	P
B08#	9.855	9.849	0.061	4.191	4.158	99.21	P
B09#	9.867	9.860	0.071	4.190	4.154	99.14	P
B10#	9.956	9.951	0.050	4.193	4.156	99.12	P

表 3 振动/ Table 3: Vibration

编号 /No.	质量/Mass(g)			电压/Voltage(V)			判定 /Verdict
	试验前 M1 /Before test M1	试验后 M2 /After test M2	质量损失 /Mss loss (%)	试验前 OCV1 /Before test OCV1	试验后 OCV2 After test OCV2	OCV2/OCV1 (%)	
B01#	9.888	9.886	0.020	4.160	4.158	99.95	P
B02#	9.965	9.964	0.010	4.152	4.150	99.95	P
B03#	9.973	9.972	0.010	4.161	4.158	99.93	P
B04#	9.972	9.972	0.000	4.161	4.160	99.98	P
B05#	9.845	9.843	0.020	4.169	4.166	99.93	P
B06#	9.948	9.946	0.020	4.165	4.165	100.00	P
B07#	9.864	9.864	0.000	4.162	4.161	99.98	P
B08#	9.849	9.848	0.010	4.158	4.157	99.98	P
B09#	9.860	9.859	0.010	4.154	4.154	100.00	P
B10#	9.951	9.951	0.000	4.156	4.155	99.98	P

表 4 冲击/ Table 4：Shock

编号/ No.	质量/Mass(g)			电压 Voltage(V)			判定/ Verdict
	试验前 M1 /Before test M1	试验后 M2 /After test M2	质量损失 /Mss loss (%)	试验前 OCV1 /Before test OCV1	试验后 OCV2 /After test OCV2	OCV2/OCV1 (%)	
B01#	9.886	9.885	0.010	4.158	4.156	99.95	P
B02#	9.964	9.964	0.000	4.150	4.150	100.00	P
B03#	9.972	9.972	0.000	4.158	4.156	99.95	P
B04#	9.972	9.971	0.010	4.160	4.160	100.00	P
B05#	9.843	9.843	0.000	4.166	4.165	99.98	P
B06#	9.946	9.945	0.010	4.165	4.163	99.95	P
B07#	9.864	9.864	0.000	4.161	4.159	99.95	P
B08#	9.848	9.846	0.020	4.157	4.155	99.95	P
B09#	9.859	9.858	0.010	4.154	4.152	99.95	P
B10#	9.951	9.951	0.000	4.155	4.154	99.98	P

表 5 外部短路/ Table 5:External short circuit

编号/ No.	壳体最高温度/ Maximum case temperature(°C)	判定/ Verdict
B01#	55.6	P
B02#	55.8	P
B03#	56.0	P
B04#	55.8	P
B05#	56.2	P
B06#	55.7	P
B07#	55.5	P
B08#	55.6	P
B09#	55.6	P
B10#	55.9	P

表 6 Table 6 ☐ 撞击 Impack ☒挤压 Crush

编号/ No.	壳体最高温度/ Maximum case temperature(°C)	判定/ Verdict
C01#	26.4	P
C02#	25.9	P
C03#	26.7	P
C04#	26.1	P
C05#	26.3	P

表 7 过度充电 / Table 7: Overcharge

编号/ No.	B11#	B12#	B13#	B14#	B15#	B16#	B17#	B18#
判定/ Verdict	P	P	P	P	P	P	P	P

表 8 强制放电/ Table 8:Forced discharge

编号/ No.	C06#	C07#	C08#	C09#	C10#	C11#	C12#	C13#	C14#	C15#
判定 /Verdict	P	P	P	P	P	P	P	P	P	P
编号/ No.	C16#	C17#	C18#	C19#	C20#	C21#	C22#	C23#	C24#	C25#
判定 /Verdict	P	P	P	P	P	P	P	P	P	P

Photos

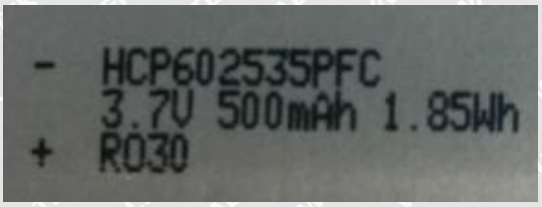

Photo 1

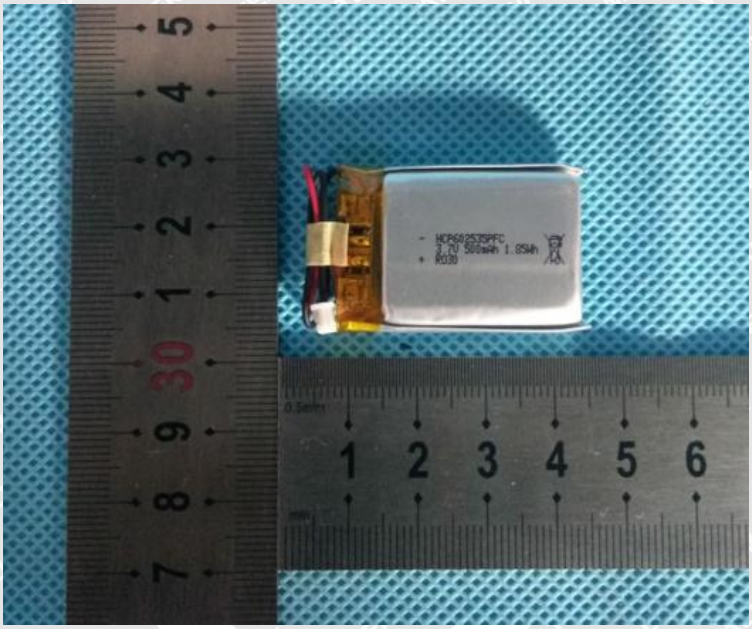

Photo 2

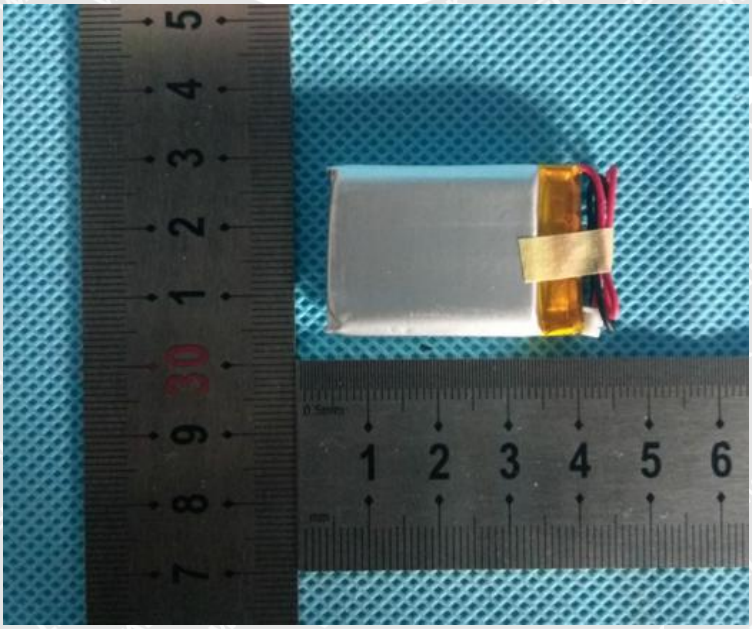

Photo 3

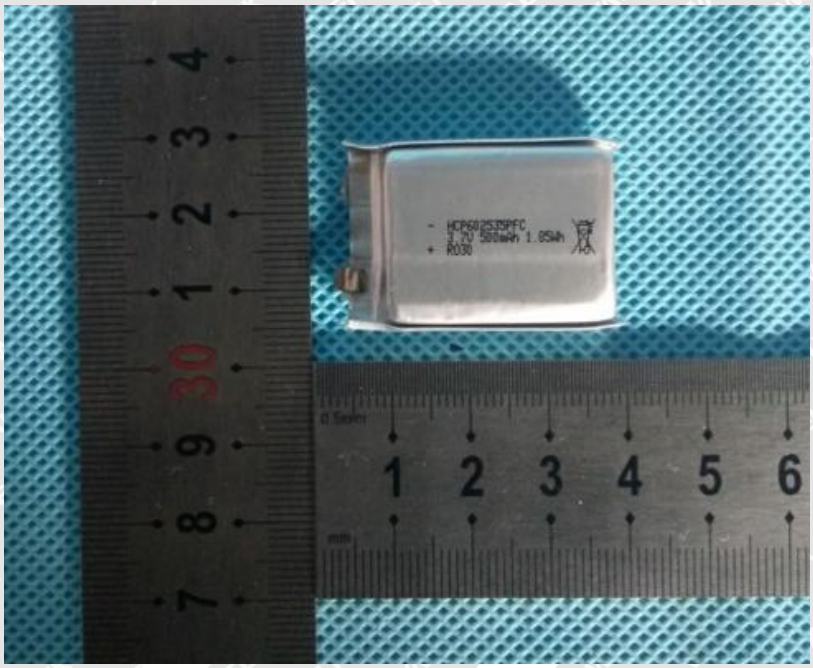

Photo 4

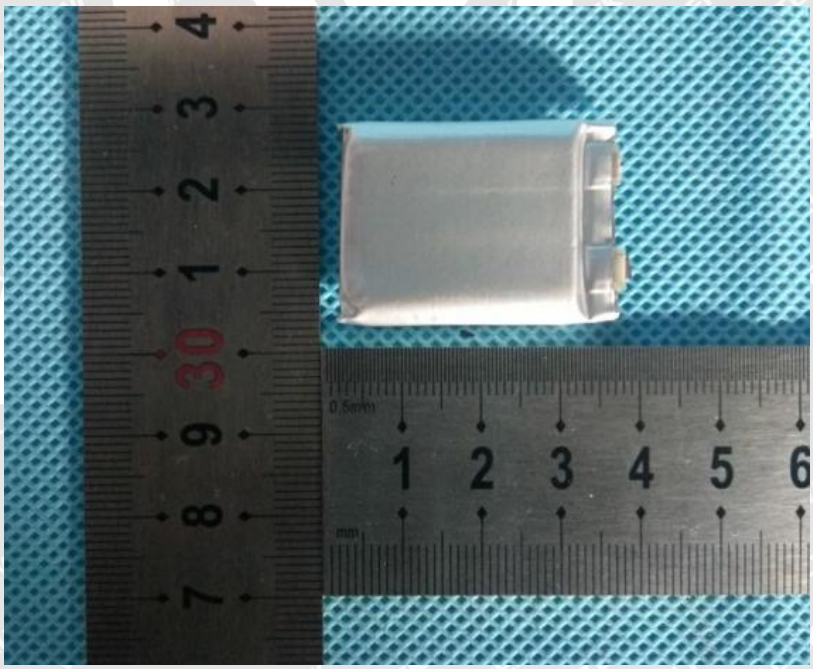

Photo 5

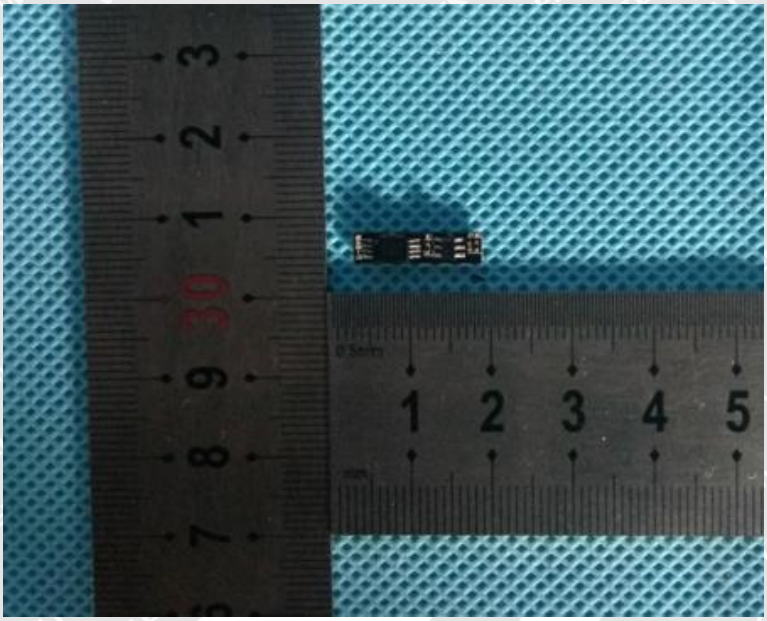

Photo 6

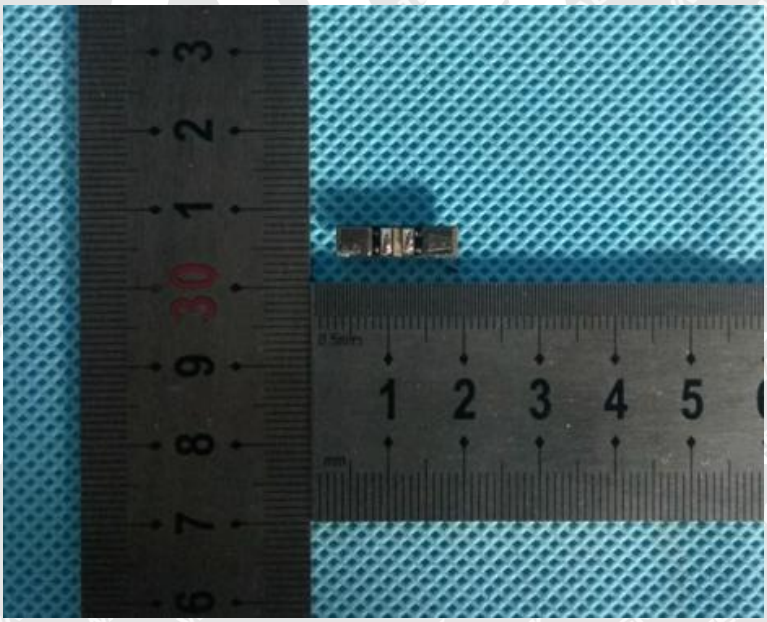

Photo 7

====== End of Report ======