三帕认证

中国认可
国际互认
检测
TESTING
CNAS L11167

检 测 报 告

TEST REPORT

Name Of Sample：	Polymer Li-ion Battery
样品名称：	聚合物锂离子电池
Model： **型号：**	LC 451726
Applicant：	SHENZHEN BLUECHAO TECHNOLGY CO., LTD
申请商：	深圳市蓝巢科技有限公司
Report No： **报告编号.：**	SZLC20200601UN01

广州三帕认证技术服务有限公司

Guangzhou CP-UP Certification Technology Service Co., Ltd.

General information 基本信息		
Name of samples 样品名称		Polymer Li-ion Battery 聚合物锂离子电池
Model/型号		LC 451726
Ratings/额定参数		3.7V, 180mAh, 0.666Wh
Trade mark/商标		N/A
Appearance 样品外观		Prismatic and Silvery gray 棱柱形和银灰色
Dimensions/尺寸		4.6mm(T)×17mm(W)×28mm(H)
Mass/质量		Approx./约 3.85 g
Applicant 申请商		SHENZHEN BLUECHAO TECHNOLGY CO., LTD 深圳市蓝巢科技有限公司
Applicant address 申请商地址		7th Floor, Building A3, Zhongtai Information Technology Industrial Park, Shiyan Street, Baoan District, Shenzhen 深圳市宝安区石岩街道中泰信息技术产业园 A3 栋 7 楼
Manufacturer 制造商		BLUECHAO TECHNOLOGY (DONGGUAN) CO., LTD 蓝巢科技(东莞)有限公司
Manufacturer Contact information 制造商联系信息	address 地址	3rd Floor, No.33, Shiyong Private Industrial Zone, Hengli Town, Dongguan City 东莞市横沥镇石涌民营工业区 33 号 3 楼
	Tel./电话	0769-81890286
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Factory 生产厂		BLUECHAO TECHNOLOGY (DONGGUAN) CO., LTD 蓝巢科技(东莞)有限公司
Factory address 生产厂地址		3rd Floor, No.33, Shiyong Private Industrial Zone, Hengli Town, Dongguan City 东莞市横沥镇石涌民营工业区 33 号 3 楼
Receiving date 接样日期		2020.06.01
Test date 检测起讫日期		2020.06.01~2020.06.15
Testing Laboratory 检测单位		Guangzhou CP-UP Certification Technology Service Co., Ltd. 广州三帕认证技术服务有限公司
Testing Laboratory information 检测单位联系信息	address 地址	No.1, Aigang 7th Lane, Yunxing Zhukeng Village, Shiqiao Street, Panyu District, Guangzhou, Guangdong China 广东省广州市番禺区市桥街云星珠坑村矮岗七巷 1 号
	Tel./电话	86-020 3112 7037
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Test Conclusion 检测结论					
Clause 条款号	Name of test 检测项目名称	Testing standard 检测标准	Test result 检测结果	Conclusion 本项结论	Remarks 备注
38.3.4.1	Altitude simulation 高度模拟	UNITED NATIONS Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria Sixth revised edition Amendment 1 (ST/SG/AC.10/11/Rev.6/ Amend.1) Section 38.3. 联合国《关于危险货物运输的建议书试验和标准手册》第六修订版修正 1 (ST/SG/AC.10/11/Rev.6/ Amend.1) 第 38.3 节	See Appendix 1 见附表 1	P 通过	-
38.3.4.2	Thermal test 温度试验		See Appendix 2 见附表 2	P 通过	-
38.3.4.3	Vibration 振动		See Appendix 3 见附表 3	P 通过	-
38.3.4.4	Shock 冲击		See Appendix 4 见附表 4	P 通过	-
38.3.4.5	External Short-circuit 外部短路		See Appendix 5 见附表 5	P 通过	-
38.3.4.6	Impact 撞击		-	N/A 不适用	-
	Crush 挤压		See Appendix 6 见附表 6	P 通过	-
38.3.4.7	Overcharge 过度充电		See Appendix 7 见附表 7	P 通过	-
38.3.4.8	Forced discharge 强制放电		See Appendix 8 见附表 8	P 通过	-
Test environment condition 检测环境条件		Ambient temperature: 20±5℃ 环境温度：20±5℃	Ambient humidity: <75% 环境湿度:<75%		
Test conclusion 检测结论		The sample has passed the test items of UNITED NATIONS Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria Sixth revised edition Amendment 1 (ST/SG/AC.10/11/Rev.6/ Amend.1) Section 38.3. 经检测，该样品符合联合国《关于危险货物运输的建议书试验和标准手册》第六修订版修正 1 (ST/SG/AC.10/11/Rev.6/ Amend.1) 第 38.3 节的要求。 Date of issue/签发日期：2020.06.17			
Tested by 检测		Max Feng	Max Feng		
Reviewed by 审核		Tracy Chen	Tracy Chen		
Approved by 批准		Leo Zhi	Leo Zhi	Technical director 技术负责人	

Appendix 1
附表 1

Test Items 检测项目	Altitude simulation 高度模拟						
1.1	Test procedure 检测程序						
	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℃). 试验电池和电池组应在压力等于或低于 11.6 千帕和环境温度(20 ± 5℃)下存放至少 6 小时。						
1.2	Sample status 样品状态						
	B1#~B5#, first cycle, fully charged state;B1#~B5#,第 1 个充电周期，完全充电状态 B6#~B10#, 25th cycle, fully charged state;B6#~B10#,第 25 个充电周期，完全充电状态						
1.3	Result 检测结果						
Sample No. 样品编号	Before 检测前		After 检测后		Mass loss 质量损失 (%)	Residual OCV 剩余电压 (%)	Observations 观察现象
	Mass 样品质量 (g)	Voltage 开路电压 (V)	Mass 样品质量 (g)	Voltage 开路电压 (V)			
B1#	3.874	4.187	3.873	4.184	0.026	99.93	O
B2#	3.843	4.194	3.842	4.189	0.026	99.88	O
B3#	3.863	4.187	3.862	4.183	0.026	99.90	O
B4#	3.744	4.184	3.742	4.178	0.053	99.86	O
B5#	3.881	4.190	3.879	4.184	0.052	99.86	O
B6#	3.885	4.185	3.884	4.180	0.026	99.88	O
B7#	3.870	4.191	3.869	4.188	0.026	99.93	O
B8#	3.836	4.192	3.835	4.187	0.026	99.88	O
B9#	3.821	4.195	3.820	4.191	0.026	99.91	O
B10#	3.837	4.185	3.836	4.183	0.026	99.95	O
Note:L-Leakage, V-Venting, D-Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire. 注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。							

Appendix 2

附表 2

Test Items 检测项目	Thermal test 温度试验
1.1	Test procedure 检测程序
	Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃, The maximum time interval between test temperature extremes in 30 minutes, This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5℃). 试验电池和电池组应先在试验温度等于 72±2℃的条件下存放至少 6 小时，接着再在试验温度等于 -40±2℃的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行，共完成 10 次，接着将所有试验电池和电池组在环境温度(20±5℃)下存放 24 小时。
1.2	Sample status 样品状态
	B1#~B5#, first cycle, fully charged state;B1#~B5#,第 1 个充电周期，完全充电状态 B6#~B10#, 25th cycle, fully charged state;B6#~B10#,第 25 个充电周期，完全充电状态
1.3	Result 检测结果

Sample No. 样品编号	Before 检测前		After 检测后		Mass loss 质量损失 (%)	Residual OCV 剩余电压 (%)	Observations 观察现象
	Mass 样品质量 (g)	Voltage 开路电压 (V)	Mass 样品质量 (g)	Voltage 开路电压 (V)			
B1#	3.873	4.184	3.872	4.153	0.026	99.26	O
B2#	3.842	4.189	3.842	4.156	0.000	99.21	O
B3#	3.862	4.183	3.861	4.152	0.026	99.26	O
B4#	3.742	4.178	3.742	4.147	0.000	99.26	O
B5#	3.879	4.184	3.879	4.156	0.000	99.33	O
B6#	3.884	4.180	3.883	4.151	0.026	99.31	O
B7#	3.869	4.188	3.869	4.153	0.000	99.16	O
B8#	3.835	4.187	3.835	4.155	0.000	99.24	O
B9#	3.820	4.191	3.820	4.157	0.000	99.19	O
B10#	3.836	4.183	3.836	4.151	0.000	99.24	O

Note:L-Leakage, V-Venting, D-Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

Appendix 3
附表 3

Test Items 检测项目	Vibration 振动
1.1	Test procedure 检测程序
	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, The vibration shall be a sinusoidal wave form with a logarithmic sweep between 7Hz and 200Hz and back to 7 Hz traversed in 15 minutes, This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell.One of the directions of vibration must be perpendicular to the terminal face. 电池和电池组紧固于振动机平台，但紧固程度不能造成电池变形以致不能准确传递振动。振动应是正弦波形，对数频率扫描从 7 赫兹到 200 赫兹，再回到 7 赫兹，跨度为 15 分钟。这一振动过程须对三个互相垂直的电池安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。
1.2	Sample status 样品状态
	B1#~B5#, first cycle, fully charged state;B1#~B5#,第 1 个充电周期，完全充电状态 B6#~B10#, 25th cycle, fully charged state;B6#~B10#,第 25 个充电周期，完全充电状态
1.3	Result 检测结果

Sample No. 样品编号	Before 检测前		After 检测后		Mass loss 质量损失 (%)	Residual OCV 剩余电压 (%)	Observations 观察现象
	Mass 样品质量 (g)	Voltage 开路电压 (V)	Mass 样品质量 (g)	Voltage 开路电压 (V)			
B1#	3.872	4.153	3.872	4.153	0.000	100.00	O
B2#	3.842	4.156	3.841	4.156	0.026	100.00	O
B3#	3.861	4.152	3.861	4.152	0.000	100.00	O
B4#	3.742	4.147	3.742	4.147	0.000	100.00	O
B5#	3.879	4.156	3.879	4.155	0.000	99.98	O
B6#	3.883	4.151	3.883	4.151	0.000	100.00	O
B7#	3.869	4.153	3.868	4.152	0.026	99.98	O
B8#	3.835	4.155	3.834	4.155	0.026	100.00	O
B9#	3.820	4.157	3.820	4.156	0.000	99.98	O
B10#	3.836	4.151	3.836	4.151	0.000	100.00	O

Note:L-Leakage, V-Venting, D-Disassembly, R -Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

Appendix 4
附表 4

Test Items 检测项目	Shock 冲击
1.1	Test procedure 检测程序
	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 battery, Each cell shall be subjected to a half-sine shock of peak acceleration of 150gn and pulse duration of 6 milliseconds, 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. 试验电池和电池组用坚固支架紧固在试验机上，支架支撑着每个试验电池组的所有安装面。 每个电池须经受最大加速度 150 gn 和脉冲持续时间 6 毫秒的半正弦波冲击。每个电池或电池组须在三个互相垂直的电池或电池组安装方位的正极方向经受三次冲击，接着在负极方向经受三次冲击，总共经受 18 次冲击。
1.2	Sample status 样品状态
	B1#~B5#, first cycle, fully charged state;B1#~B5#,第 1 个充电周期，完全充电状态 B6#~B10#, 25th cycle, fully charged state;B6#~B10#,第 25 个充电周期，完全充电状态
1.3	Result 检测结果

Sample No. 样品编号	Before 检测前		After 检测后		Mass loss 质量损失 (%)	Residual OCV 剩余电压 (%)	Observations 观察现象
	Mass 样品质量 (g)	Voltage 开路电压 (V)	Mass 样品质量 (g)	Voltage 开路电压 (V)			
B1#	3.872	4.153	3.872	4.153	0.000	100.00	O
B2#	3.841	4.156	3.841	4.156	0.000	100.00	O
B3#	3.861	4.152	3.861	4.152	0.000	100.00	O
B4#	3.742	4.147	3.742	4.147	0.000	100.00	O
B5#	3.879	4.155	3.879	4.155	0.000	100.00	O
B6#	3.883	4.151	3.883	4.151	0.000	100.00	O
B7#	3.868	4.152	3.867	4.152	0.026	100.00	O
B8#	3.834	4.155	3.834	4.154	0.000	99.98	O
B9#	3.820	4.156	3.820	4.156	0.000	100.00	O
B10#	3.836	4.151	3.836	4.151	0.000	100.00	O

Note:L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, O-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

Appendix 5 附表 5		
Test Items 检测项目	External short circuit 外部短路	
1.1	Test procedure 检测程序	
	The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4℃,measured on the external case ,This period of time depends on the size 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. 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 . This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃. 对于待试电池或电池组，应加温一段必要的时间，使从外壳测量的温度达到均匀的稳定温度 57±4°C。这段时间的长短取决于电池或电池组的大小和设计，对于这个持续时间应加以评估和记录。如无法进行这种评估，则小型电池和小型电池组的暴露时间应至少 6 小时。然后，电池或电池组应在 57 ± 4°C 条件下经受总外电阻小于 0.1 欧姆的短路条件。这一短路条件应在电池或电池组外壳温度回到 57 ± 4°C 后继续至少 1 小时.	
1.2	Sample status 样品状态	
	B1#~B5#, first cycle, fully charged state;B1#~B5#,第 1 个充电周期，完全充电状态 B6#~B10#, 25th cycle, fully charged state;B6#~B10#,第 25 个充电周期，完全充电状态	
1.3	Result 检测结果	
Sample No. 样品编号	Max. External Temperature 样品表面最高温度 (℃)	Observations 观察现象
B1#	57.9	O
B2#	57.5	O
B3#	57.8	O
B4#	57.4	O
B5#	57.7	O
B6#	57.5	O
B7#	57.9	O
B8#	57.6	O
B9#	57.8	O
B10#	57.7	O
Note:D -Disassembly, R -Rupture, F-Fire, O- no disassembly, no rupture, no fire. 注：D- 解体；R- 破裂；F - 起火；O-无解体、无破裂、无起火。		

Appendix 6 附表 6		
Test Items 检测项目	Crush 挤压	
1.1	Test procedure 检测程序	
	A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached. (a) The applied force reaches 13kN±0.78kN; (b) The voltage of the cell drops by at least 100 mV; or (c) The cell is deformed by 50% or more of its original thickness. Once the maximum pressure has been obtained, the voltage drops by 100mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released. 将电池或元件电池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为 1.5 厘米/秒。挤压持续进行，直到出现以下三种情况之一： (a)施加的力量达到 13 千牛顿±0.78 千牛顿；例如：用一个活塞直径 32 毫米的液压顶施力，直到液压顶的压力达到 17 兆帕。(b)电池的电压下降至少 100 毫伏；或(c)电池变形达原始厚度的 50%或以上。一旦达到最大压力、电压下降 100 毫伏或更多，或电池变形至少达原厚度的 50%，即可解除压力。	
1.2	Sample status 样品状态	
	C1#~C5#, first cycle , 50% charged state ;C1#~C5#,第 1 个充电周期，50% 充电状态 C6#~C10#, 25th cycle , 50% charged state ;C6#~C10#,第 25 个充电周期，50% 充电状态	
1.3	Result 检测结果	
Sample No. 样品编号	Max. External Temperature 样品表面最高温度(℃)	Observations 观察现象
C1#	23.7	O
C2#	23.5	O
C3#	23.8	O
C4#	23.9	O
C5#	23.6	O
C6#	23.8	O
C7#	23.7	O
C8#	23.5	O
C9#	23.9	O
C10#	23.6	O
Note:D -Disassembly, F-Fire, O- no disassembly, no fire. 注：D- 解体；F - 起火；O-无解体、无起火。		

Appendix 7

附表 7

Test Items 检测项目	Overcharge 过度充电		
1.1	Test procedure 检测程序		
	The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows: (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 or 22V (b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times maximum charge voltage 充电电流必须是制造商建议的最大持续充电电流的两倍。试验的最小电 如下： （a)制造商建议的充电电压不大于 18 伏时，试验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者。 (b)制造商建议的充电电压大于 18 伏时，试验的最小电压应为最大充电电压的 1.2 倍。 试验应在环境温度下进行。进行试验的时间应为 24 小时。		
1.2	Sample status 样品状态		
	B11#~B14#, first cycle, fully charged state;B11#~B14#,第 1 个充电周期，完全充电状态 B15#~B18#, 25th cycle, fully charged state;B15#~B18#,第 25 个充电周期，完全充电状态		
1.3	Result 检测结果		
Sample No. 样品编号	Test voltage 试验电压(V)	Test current 试验电流(mA)	Observations 观察现象
B11#	8.5	360	O
B12#	8.5	360	O
B13#	8.5	360	O
B14#	8.5	360	O
B15#	8.5	360	O
B16#	8.5	360	O
B17#	8.5	360	O
B18#	8.5	360	O
Note:D -Disassembly, F-Fire, O- no disassembly, no fire. 注： D- 解体；F - 起火；O-无解体、无起火。			

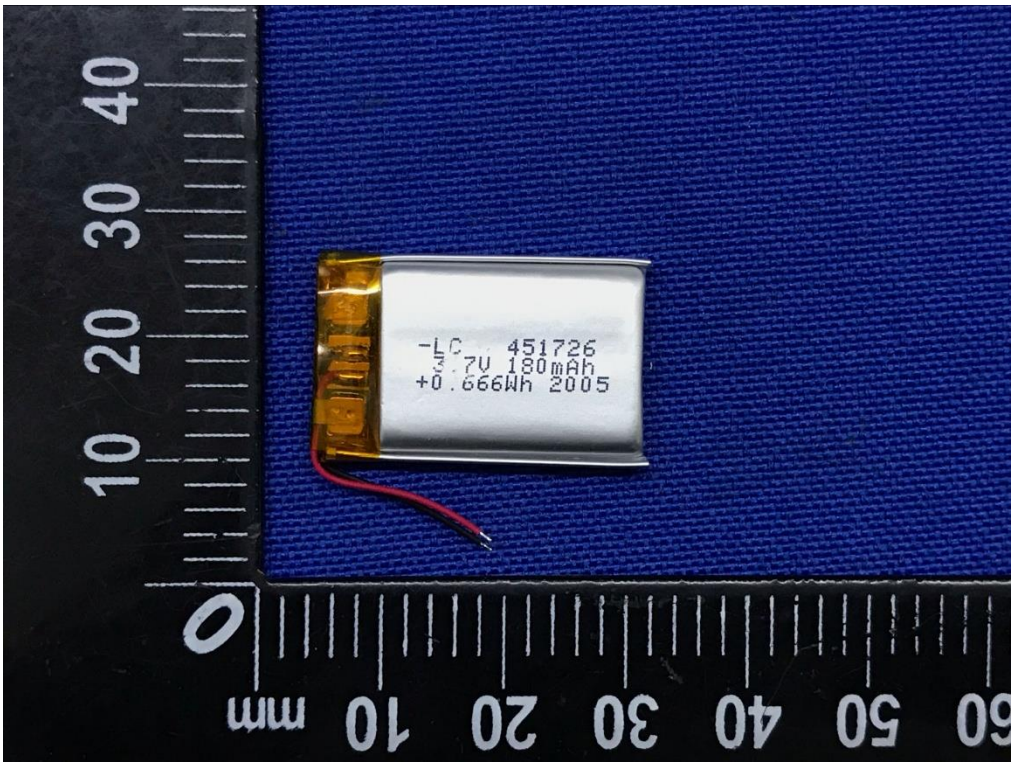
Appendix 8

附表 8

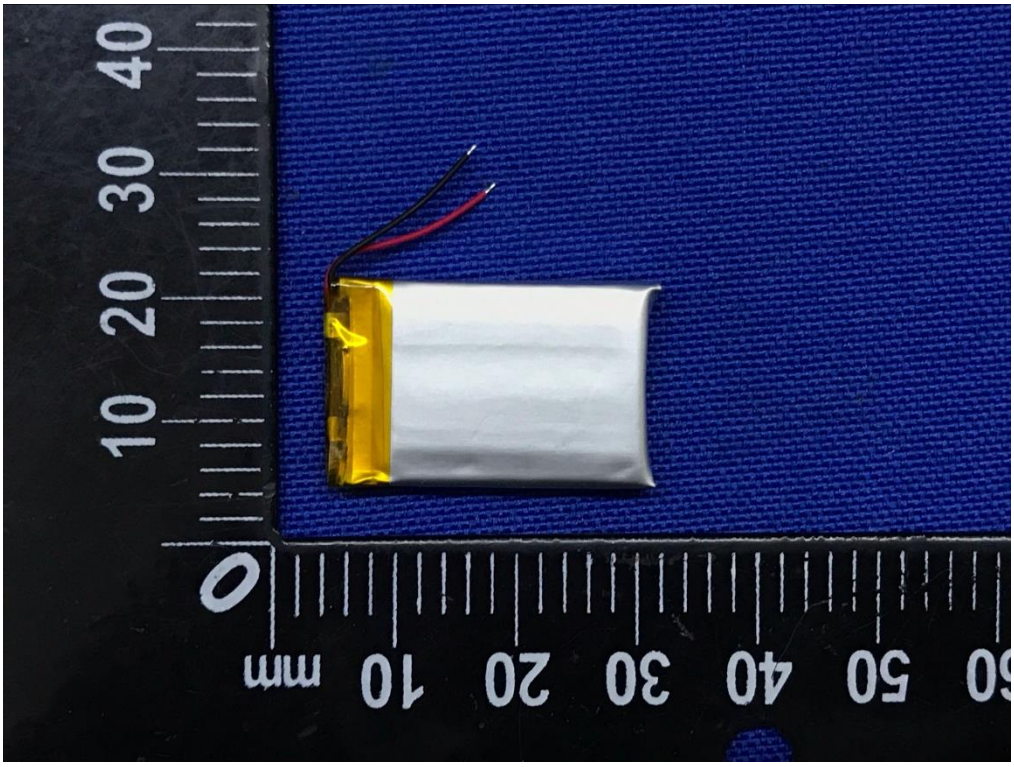
Test Items 检测项目	Forced discharge 强制放电				
1.1	Test procedure 检测程序				
	Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12V D. C, power supply at an initial current equal to the maximum discharge current specified the manufacturer .The specified discharge 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). 每个电池应在环境温度下与 12 伏直流电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。将适当大小和额定值的电阻负荷与试验电池串联，计算得出给定的放电电流。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)。				
1.2	Sample status 样品状态				
	C11#~C20#, first cycle , fully discharged state ;C11#~C20#,第 1 个充电周期,完全放电状态 C21#~C30#, 25th cycle , fully discharged state ;C21#~C30#,第 25 个充电周期,完全放电状态				
1.3	Result 检测结果				
Sample No. 样品编号	Maximum discharge current 最大放电电流 (mA)	Observations 观察现象	Sample No. 样品编号	Maximum discharge current 最大放电电流 (mA)	Observations 观察现象
C11#	180	O	C21#	180	O
C12#	180	O	C22#	180	O
C13#	180	O	C23#	180	O
C14#	180	O	C24#	180	O
C15#	180	O	C25#	180	O
C16#	180	O	C26#	180	O
C17#	180	O	C27#	180	O
C18#	180	O	C28#	180	O
C19#	180	O	C29#	180	O
C20#	180	O	C30#	180	O
Note:D -Disassembly, F-Fire, O- no disassembly, no fire. 注： D- 解体；F - 起火；O-无解体、无起火。					

Photos

照片



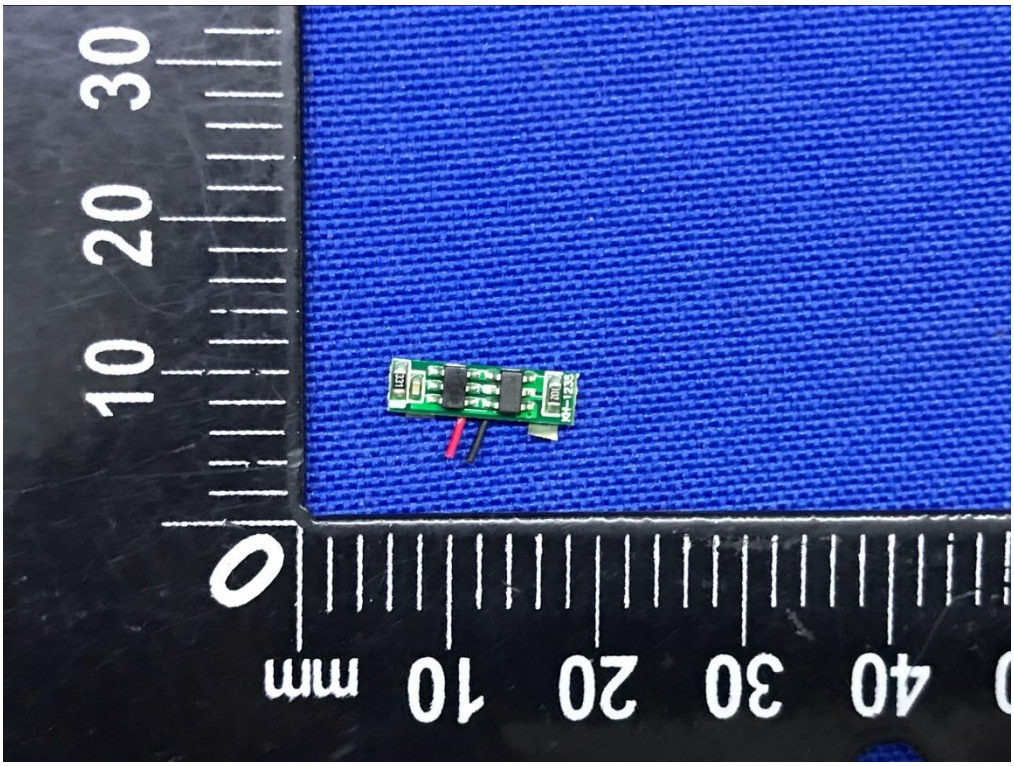
电池正面



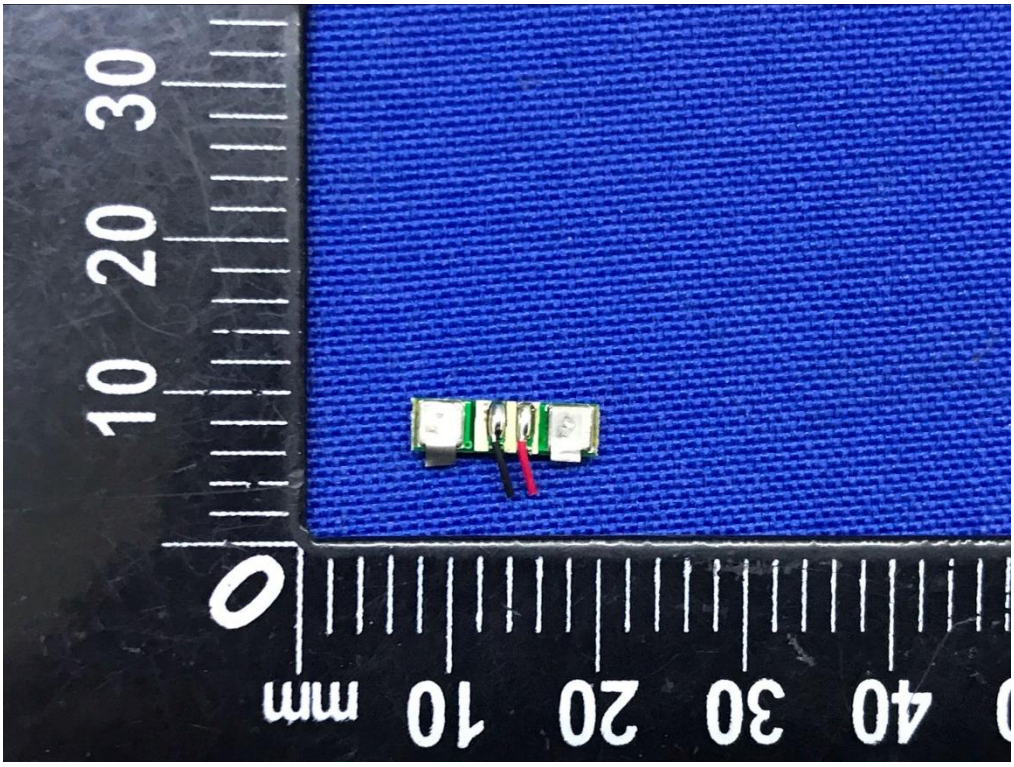
电池反面

Photos

照片



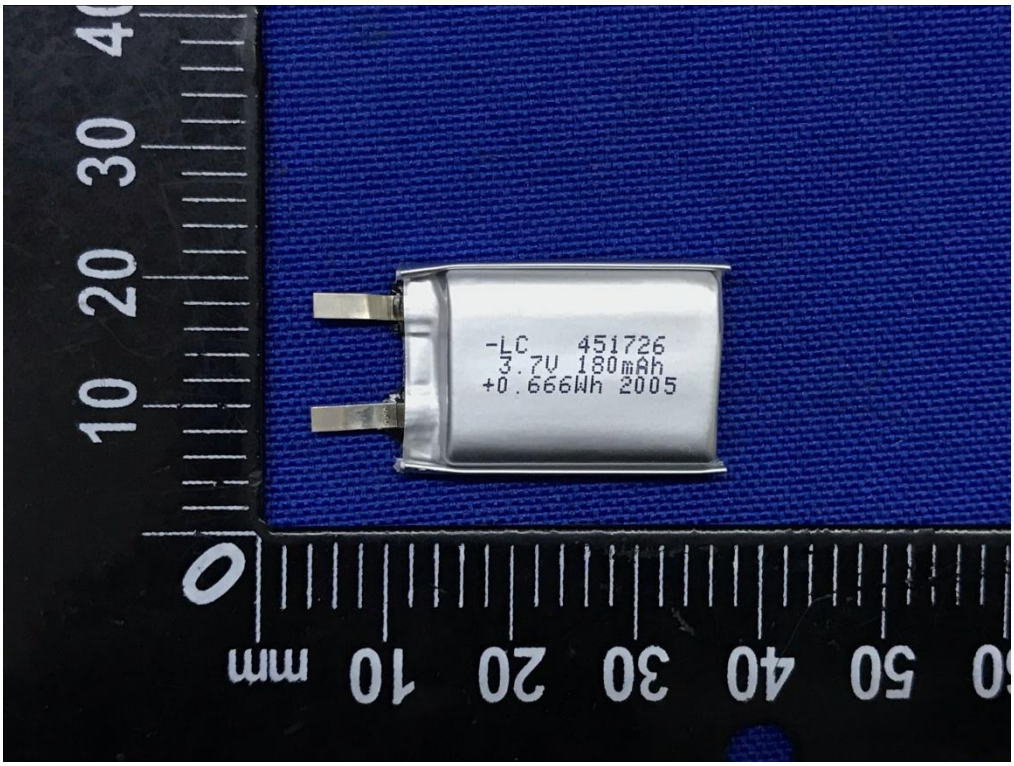
PCM 正面



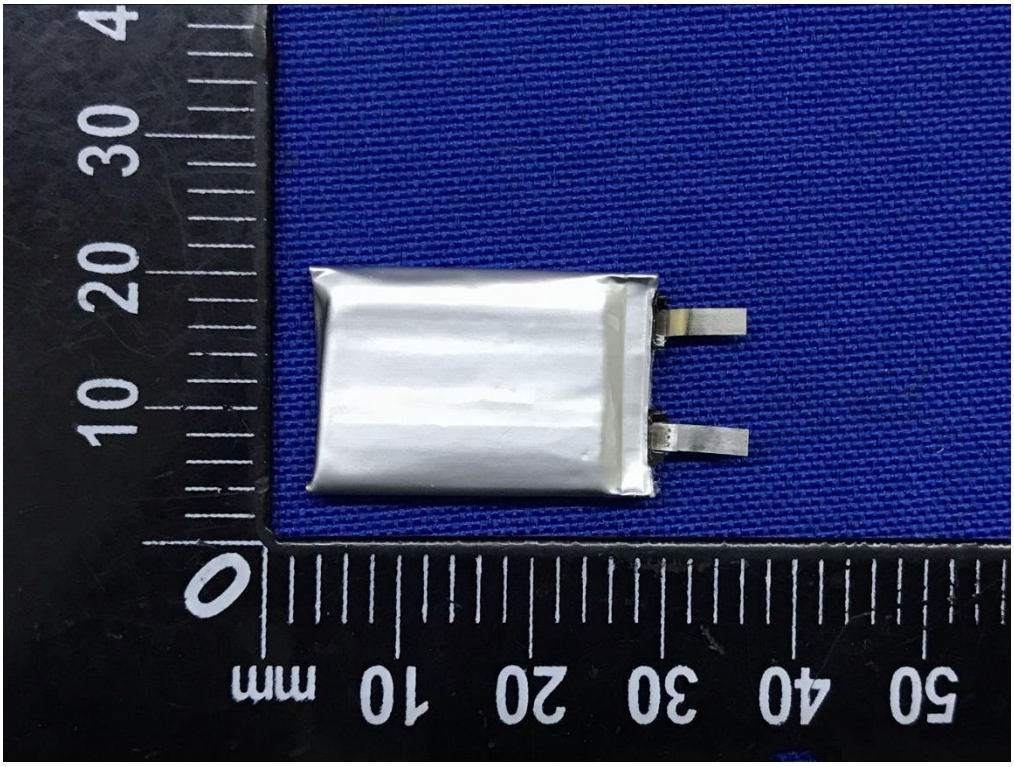
PCM 反面

Photos

照片



电芯正面



电芯反面

注 意 事 项
Notice

1. 本报告无检测单位检测章无效。
   The test report is invalid without the testing stamp of Guangzhou CP-UP Certification Technology Service Co., Ltd..
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 Guangzhou CP-UP Certification Technology Service Co., Ltd..
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 Approver, Checker and Tester.
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 Guangzhou CP-UP Certification Technology Service Co., Ltd. Within 15 days.
6. 本报告仅对来样负责。
   The test report is responsible for the tested samples only.
7. 检测结论中“N/A”表示“不适用”，“P”表示“通过”，“F”表示“不通过”。
   As for the test conclusion, “N/A” means “not applicable”, “P” means “pass” and “F” means “fail”.
8. 型号与额定参数来源于申请商提供的资料，若因存在真实性问题而影响检测结果的有效性，本试验室不承担任何相关责任。
   The model and rated parameter is from the information provided by the applicant. Our lab shall not take any responsibility if the information is fake and exaggerated, which may influence the validity of the testing result.

--End of report--

--报告结束--