UN 38.3
检 测 报 告

产品名称及型号: Product Name &Model:	光储充电池/ PD05 Storage Battery / PD05
委托方名称: Applicant's name:	惠州市华阳光电技术有限公司 HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.
委 托方 地址: Applicant's Address:	广东省惠州市东江高新科技产业园上霞北路1号华阳工业园B区6号楼 Building No.6, Foryou Industrial Park Area B, No.1 North Shangxia Road, Dongjiang High-tech Industry Park, Huizhou, Guangdong, China.
样品接收日期: Accepted date:	Apr. 09, 2024
检 测 日 期: Tested Date:	Apr. 09, 2024 to May 16, 2024
报告编号: Report no:	POCE240514020RL001
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深圳市宝测达科技有限公司
SHENZHEN POCE TECHNOLOGY CO., LTD.

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产品名称: Product Name:	光储充电池 Storage Battery	型号: Model:	PD05
商标 : Trade Mark:	ADAYO	制造商: Manufacturer:	惠州市华阳光电技术有限公司 HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.
样品编号: Sample No.:	电池组/ Batteries:B01-B08 电池/ Cells : C01-C30	检验环境: Testing Condition:	20-25℃, 45-75%R.H

样品基本信息
Basic Information

标称电压 Nominal Voltage	51.2V	充电限制电压 Charge Limit Voltage	56V	额定容量 Rated capacity	100Ah, 5120Wh
标准充电电流 Standard Charge Current	100A	标准放电电流 Standard Discharge Current	100A	最大充电电流 Max. Charge Current	100A
最大放电电流 Max. Discharge Current	100A	充电截止电流 End Charge Current	5A	放电截止电压 Final Discharge Voltage	46V
外观 Shape	☒近棱柱形 Almost cuboid	样品尺寸 Size	580*370*260(mm) L*W*H(mm)	内部电池个数 Internal cells Count	16pcs(16S1P)
	☐近圆柱形 Almost Cylindrical			电池制造商 Cell manufacturer	深圳市特派科技有限公司 TOPA Technology Limited

测试方法和判定标准/ Test method and criterion:

Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.7 Part III 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》第七版 第III部分38.3章节 (ST/SG/AC.10/11/Rev.7 Part III Section 38.3)

检验项目/ Test Item:

T.1: Altitude simulation,T.2:Thermal test, T.3: Vibration,T.4: Shock,T.5: External short circuit, T.6: ~~Impact/~~Crush,T.7:Overcharge,T.8: Forced discharge

T.1: 高度模拟, T.2: 温度测试, T.3:振动, T.4:冲击, T.5:外部短路, T.6: ~~撞击/~~挤压, T.7:过充电, T.8:强制放电

测试结论/ Conclusion:

经测试,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》ST/SG/AC.10/11/Rev.7 Part III Subsection 38.3, 测试结果为合格。

The sample has passed the test items of UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.7 Part III Section 38.3, test results are **PASS.**

(检测单位盖章/Sealed)

检 测: Tested by:	钱峰	主管审核: Reviewed by:	吴骏杰	经理批准: Approved by:	钱清东

测试程序：

Test Procedure:

1. 每一种类型的电池均应进行 T.1 至 T.8 项试验。电池必须按顺序在相同的一组电池上进行试验 T.1 至T.5。试验 T.6 和 T.8 应使用未另外试验过的电池。试验 T.7 可以使用先前在试验 T.1 至 T.5 中使用过的未损坏电池进行，以便测试进行在循环过的电池上。

Each battery type is subjected to tests T.1 to T.8. Tests T.1 to T.5 are conducted in sequence on the same battery. Tests 6 and 8 are conducted using not otherwise tested batteries. 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.

2. 为了量化质量损失，可用以下公式计算：质量损失(%)=(M 1 -M 2)/M 1 ×100

In order to quantify the mass loss, the following procedure is provided:

Mass loss(%)=(M 1 -M 2)/M 1 ×100

式中：M 1 是试验前的质量，M 2 是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

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 Table below, it is considered as "no mass loss"

电芯或电池的质量 Mass M of cell or battery	质量损失限值 Mass loss limit
M＜1g	0.5%
1g ≤ M ≤ 75g	0.2%
M＞75g	0.1%

3. 在测试 T.1 至 T.4 中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验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%。

In test T.1 to T.4, batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test battery after testing is not less than 90% of its voltage immediately prior to this procedure

一般说明 / General remark:

本报告出现的试验结果仅与试验样品有关.

The test results presented in this report relate only to the object tested.

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可能的试验情况判定 / Possible test case verdicts:	
－试验情况不适用本试验产品 － Test case does not apply to the test object	N/A (or N)
－试验样品满足要求 － Test object does meet the requirement	P (Pass)
－试验样品不满足要求 － Test object does not meet the requirement	F (Fail)

测试项目及样品编号描述：

Test items description and number of the sample:

Test items测试项目	Sample Number 样品编号
T.1: 高度模拟/Altitude simulation	电池组/ Batteries: B01~B04
T.2: 温度测试/ Thermal test	
T.3: 振动/ Vibration	
T.4: 冲击/ Shock	
T.5: 外短路/External short circuit	
T.6: 挤压/ Crush or ~~撞击/Impact~~	电池/Cells: C01~C10
T.7 过充电/ Overcharge	电池组/ Batteries: B05~B08
T.8: 强制放电/ Forced discharge	电池/Cells: C11~C30

样品预处理状态描述说明:

Pre-treatment status description and illustration of sample:

Test item 测试项目	Sample No. 样品编号	Pre-treatment sate 预处理状态	Remark 备注
T.1~T.5	B01~B02	At first cycle, in fully charged states. 在第一次循环完全充电状态。	--
	B03~B04	After 25 cycles ending in fully charged states. 在25次循环结束后完全充电状态。	--
T.6	C01~C05	At first cycle at 50% of the design rated capacity. 在第一次循环50%额定容量的荷电状态。	--
	C06~C10	After 25 cycles ending at 50% of the design rated capacity. 在25次循环结束后50%额定容量的荷电状态。	--
T.7	B05~B06	At first cycle, in fully charged states. 在第一次循环完全充电状态。	--
	B07~B08	after 25 cycles ending in fully charged states. 在25次循环结束后完全充电状态。	--
T.8	C11~C20	At first cycle, in fully discharged states. 在第一次循环完全放电状态。	--
	C21~C30	After 25 cycles ending in fully discharged states. 在25次循环结束后完全放电状态。	--

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
38.3.4.1	**Test T.1: Altitude simulation/高度模拟**		**P**
	Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C)/将电芯和电池在温度为20±5°C、大气压力不大于11.6kpa的环境中贮存不少于6个小时。		P
	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if 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. /电芯和电池符合要求：无质量损失、无漏液、无泄气、无分解、无破裂以及无着火现象；电芯或电池测试后的开路电压不低于测试前开路电压的90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池。	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. 无质量损失、无漏液、无泄气、无分解、无破裂、 无着火，且测试后开路电压大于测试前开路电压的90%。	P
38.3.4.2	**Test T.2: Thermal test/温度试验**		**P**
	Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to –40±2°C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5°C). /首先将样品放在72±2°C的环境中放置至少6个小时，然后放在–40±2°C的环境中放置至少6个小时。温度转换的最大间隔时间为30分钟。如此循环10次，最后将样品放在20±5°C的环境中静置24小时。		N/A
	For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours. /对于大电芯，在高温和低温中放置的时间最少12个小时。		P

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if 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. /电芯和电池符合要求：无质量损失、无漏液、无泄气、无分解、无破裂以及无着火现象；电芯或电池测试后的开路电压不低于测试前开路电压的90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池。	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. 无质量损失、无漏液、无泄气、无分解、无破裂、 无着火，且测试后开路电压大于测试前开路电压的90%。	P
38.3.4.3	**Test T.3: Vibration/振动**		**P**
	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 waveform with a logarithmic sweep between 7 Hz and 200 Hz 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 positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. /样品必须牢固地安装在振动台 台面上。振动以正弦波形式，以7Hz增加至200Hz， 然后减少回到7Hz为一个循环，一个循环持续15分 钟。对样品从三个互相垂直的方向上循环12次，共3个小时。其中一个振动方向必须是垂直样品的极性 平面。		P
	The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries). /对于质量不大于12kg的样品(电芯和小电池)和质量超过12kg的电池(大电池)，对数扫频不同。		P
	For cells and small batteries: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz. /对于电芯和小电池，对数扫频为：从7Hz开始保持1gn的最大加速度直到频率为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8gn (频率约为50Hz)，将最大加速度保持在8gn直到频率增加到200Hz。		N/A

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
	For large batteries: from 7 Hz to a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz. /对于大电池，对数扫频为：从7Hz开始保持1gn的最大加速度直到频率为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2gn (频率约为25Hz)，将最大加速度保持在2gn直到频率增加到200Hz。		P
	Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if 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./电芯和电池符合要求：无质量损失、无漏液、无泄气、无分解、无破裂以及无着火现象；电芯或电池测试后的开路电压不低于测试前开路电压的90%。此项关于电压方面的要求不适用于完全放电后的电芯和电池。	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. 无质量损失、无漏液、无泄气、无分解、无破裂、 无着火，且测试后开路电压大于测试前开路电压的90%。 Test data see table T.3 测试数据见表格T.3.	P
38.3.4.4	**Test T.4: Shock/冲击**		**P**

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict

	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. Each cell shall be subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds. 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 provided to calculate the appropriate minimum peak accelerations. /以稳固的托架固定住每个电池/电芯样品，每个样品应该经受峰值加速度为150gn以及脉冲持续时间为6ms的半正弦冲击，另外，大型电池/电芯应该经受峰值加速度为50gn以及脉冲持续时间为11ms的半正弦冲击. 每一个电池将受到一个半正弦冲击的峰值加速度取决于电池的质量。对于小型电池，脉冲持续时间为6毫秒，对于大型电池，脉冲时间为11毫秒。下面提供的公式用来计算适当的最小峰值加速度。		P
	Battery / **Minimum peak acceleration** / **Pulse duration** **Small batteries** — **150 gn or result of formula** Acceleration(g_n)= $\sqrt{\frac{100850}{mass^*}}$ **Acceleration gn whichever is smaller** — **6 ms** **Large batteries** — **50 gn or result of formula** Acceleration(g_n)= $\sqrt{\frac{30000}{mass^*}}$ **Acceleration gn whichever is smaller** — **11 ms** ***Mass is expressed in kilograms**		P

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if 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. / 电芯和电池符合要求：无质量损失、无漏液、无泄气、无分解、无破裂以及无着火现象；电芯或电池测试后的开路电压不低于测试前开路电压的90%。 此项关于电压方面的要求不适用于完全放电后的电芯和电池。	No mass loss, no leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. 无质量损失、无漏液、无泄气、无分解、无破裂、 无着火，且测试后开路电压大于测试前开路电压90%。 Test data see table T.4 测试数据见表格T.4.	P
38.3.4.5	**Test T.5: External short circuit/外部短路**		**P**
	The cell or battery to be tested shall be shall be temperature stabilized so that its external case temperature reaches 57±4°C and then 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°C. This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4°C. /保持测试环境温度稳定在57±4°C，以便样品外表温度达到57±4°C，然后将样品正负极用小于0.1欧姆的总电阻回路进行短路，样品的外表温度恢复到57±4°C之后保持短路状态1小时以上。		P
	Cells and batteries meet this requirement if their external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test./电芯和电池符合要求：在测试过程中以及之后6个小时内，外表温度不超过170°C，并且无分解、无破裂和无着火现象发生。	External temperature is less than 170°C,also no disassembly, no rupture and no fire during the test and within six hours after the test 外表温度小于170°C，在测试中及之后6小时内, 无发生分解、破裂和着火。	P
38.3.4.6	**Test T.6: Impact / Crush/撞击/挤压**		**P**
	Test procedure – Impact (applicable to cylindrical cells greater than or equal to 18 mm in diameter) /撞击(适合于直径大于或等于18mm的圆柱形电芯)		N/A

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
	The 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. /将样品放在一个平坦的光滑平面上。将一直径为15.8 mm±0.1mm，长度不小于6cm的316不锈钢棒横过样品中部放置后，将一质量为9.1 kg±0.1 kg的重物从61±2.5 cm的高度落向样品		N/A
	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. /接受撞击的样品，纵轴应与平坦的表面平行并与横放在样品中心的直径15.8 mm±0.1mm弯曲表面的纵轴垂直。每一个样品只接受一次撞击。		N/A
	Test Procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells not more than 18 mm in diameter). /挤压 (适用于棱柱形、袋状、硬币/纽扣电芯和直径不超过18mm的圆柱形电芯)		P
	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 thefirst of the three options below is reached. /将样品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1.5cm/s。挤压持续进行，直到出现以下三种情况之一		P
	(a) The applied force reaches 13kN±0.78kN; /施加力达到13kN±0.78kN		P
	(b) The voltage of the cell drops by at least 100 mV; /样品的电压下降至少100mV		N/A
	(c) The cell is deformed by 50% or more of its original thickness. /电池变形达原始厚度的50%以上。		N/A

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
	A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. /棱柱形或袋状电芯应从最宽的一面施压。纽扣/硬币形电芯应从其平坦表面施压。圆柱形应从与纵轴垂直的方向施压。		N/A
	Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests./每个样品都是全新样品，并且只经受一次施压。施压结束后样品应静置观察6小时。		P
	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. /电芯满足要求：在测试过程中以及之后6个小时内，外表温度不超过170°C，并且无分解和无着火现象发生。	External temperature of cells is less than 170°C,also no disassembly and no fire during the test and within six hours after the test. 电芯外表温度小于170°C, 在测试中及之后6小时内无发生分解和着火。	P
38.3.4.7	**Test T.7: Overcharge/过充电**		**P**
	The charge current shall be twice the manufacturer's recommended maximum continuous charge current. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The minimum voltage of the test shall be as follows: /在室温下，以2倍的制造商宣称的最大持续充电电流对样品充电，测试时间为24小时。测试的最小电压如下：		P
	(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. /如果制造商宣称的充电电压不超过18V，本测试的最小充电电压应是制造商宣称的最大充电电压的两倍或者是22V之中的较小者。	。	N/A

ST/SG/AC.10/11/Rev.7 Section 38.3			
条款/Clause	标准要求/ Requirement + Test	结果 / Result	判定/ Verdict
	(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. /如果制造商宣称的充电电压超过18V，本测试的最小充电电压应该是制造商宣称的最大充电电压的1.2倍。	测试电压:69.72V, 充电电流:200A. The voltage of test is 69.72V and charge current is 200A	P
	There is no disassembly and no fire during the test and within seven days after the test. /在测试中和测 试完成后7天内，样品无分解和无着火。	No disassembly and no fire during the test and within seven days after the test 在测试中和测试完成后7天内无发生分解和着火。	P
38.3.4.8	**Test T.8: Forced discharge/强制放电**		**P**
	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 by the manufacturer. /在室温下，将单个电芯连接在12V的直流电源上进行强制放电，此直流电源供给每个电芯初始电流为制造商宣称的最大放电电流。 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)。		P
	There is no disassembly and no fire during the test and within seven days after the test./在测试中和测试完成后7天内，样品无分解和无着火发生。	Cells have no disassembly and no fire during the test and within seven days after the test 电芯在测试中和测试完成后7天内无发生分解和着火。	P

T.1. Altitude simulation高度模拟

The state of samples 样品状态	No. 编号	Pre-test试验前		After test试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压 (%)	Status 结果
		Mass 质量 (kg)	Voltage 电压 (V)	Mass 质量 (kg)	Voltage 电压 (V)			
at first cycle, in fully charged states 在第一次循环完全充电状态	B01	48.25	55.03	48.25	55.03	0.000	100.000	Pass 合格
	B02	48.29	55.03	48.29	55.03	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
after 25 cycles ending in fully charged states 在25次循环结束后完全充电状态	B03	48.31	55.05	48.31	55.05	0.000	100.000	Pass 合格
	B04	48.23	55.04	48.23	55.04	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Notes 注释: Ambient temperature 环境温度: 23.6°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%. 测试后，样品无渗漏、无排气、无解体、无破裂和无起火，电压比不小于 90%。

T.2. Thermal test温度试验

The state of samples 样品状态	No. 编号	Pre-test试验前		After test试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压 (%)	Status 结果
		Mass 质量 (kg)	Voltage 电压 (V)	Mass 质量 (kg)	Voltage 电压 (V)			
at first cycle, in fully charged states 在第一次循环完全充电状态	B01	48.25	55.03	48.25	55.03	0.000	100.000	Pass 合格
	B02	48.29	55.03	48.29	55.03	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
after 25 cycles ending in fully charged states 在25次循环结束后完全充电状态	B03	48.31	55.05	48.31	55.05	0.000	100.000	Pass 合格
	B04	48.23	55.04	48.23	55.04	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Notes 注释: Ambient temperature 环境温度: 23.8°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%. 测试后，样品无渗漏、无排气、无解体、无破裂和无起火,电压比不小于 90%。

T.3. Vibration振动

The state of samples 样品状态	No. 编号	Pre-test试验前		After test试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压 (%)	Status 结果
		Mass 质量 (kg)	Voltage 电压 (V)	Mass 质量 (kg)	Voltage 电压 (V)			
at first cycle, in fully charged states 在第一次循环完全充电状态	B01	48.25	55.03	48.25	55.03	0.000	100.000	Pass 合格
	B02	48.29	55.03	48.29	55.03	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
after 25 cycles ending in fully charged states 在25次循环结束后完全充电状态	B03	48.31	55.05	48.31	55.05	0.000	100.000	Pass 合格
	B04	48.23	55.04	48.23	55.04	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Notes 注释: Ambient temperature 环境温度: 23.9°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%. 测试后，样品无渗漏、无排气、无解体、无破裂和无起火,电压比不小于 90%。

T.4. Shock冲击

The state of samples 样品状态	No. 编号	Pre-test试验前		After test试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压 (%)	Status 结果
		Mass 质量 (kg)	Voltage 电压 (V)	Mass 质量 (kg)	Voltage 电压 (V)			
at first cycle, in fully charged states 在第一次循环完全充电状态	B01	48.25	55.03	48.25	55.03	0.000	100.000	Pass 合格
	B02	48.29	55.03	48.29	55.03	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
after 25 cycles ending in fully charged states 在25次循环结束后完全充电状态	B03	48.31	55.05	48.31	55.05	0.000	100.000	Pass 合格
	B04	48.23	55.04	48.23	55.04	0.000	100.000	Pass 合格
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Notes 注释: Ambient temperature 环境温度: 23.7°C
After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And change ratio is not less than 90%. 测试后，样品无渗漏、无排气、无解体、无破裂和无起火,电压比不小于 90%。

T.5. External short circuit 外部短路

The state of samples 样品状态	No. 编号	External Peak temperature(℃) 表面最高温度(℃)	Status 结果
at first cycle, in fully charged states 在第一次循环完全充电状态	B01	57.5	Pass 合格
	B02	57.7	Pass 合格
	-	-	-
	-	-	-
	-	-	-
after 25 cycles ending in fully charged states 在25次循环结束后完全充电状态	B03	57.8	Pass 合格
	B04	57.9	Pass 合格
	-	-	-
	-	-	-
	-	-	-

Notes 注释: Ambient temperature 环境温度: 57.2°C
Test sample external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.
测试样品表面温度不超过 170 °C，测试中与测试后 6 小时内无解体、无破裂、无起火。

T.6. 挤压/ Crush

The state of samples 样品状态	No. 编号	OCV prior to test 试验前电压(V)	External Peak temperature(℃) 外壳表面最高温度(℃)	Status 结果
At first cycle at 50% of the design rated capacity 在第一次循环50%额定容量的荷电状态	C01	3.358	25.1	Pass 合格
	C02	3.345	24.5	Pass 合格
	C03	3.340	24.3	Pass 合格
	C04	3.365	25.0	Pass 合格
	C05	3.356	24.6	Pass 合格
After 25 cycles ending at 50% of the design rated capacity 在25次循环结束后50%额定容量的荷电状态	C06	3.357	24.3	Pass 合格
	C07	3.347	24.1	Pass 合格
	C08	3.343	24.6	Pass 合格
	C09	3.360	24.6	Pass 合格
	C10	3.363	24.7	Pass 合格

Notes 注释: Ambient temperature 环境温度: 23.9°C
Test sample external temperature does not exceed 170 °C and there is no disassembly, no rupture and no fire during the test and within six hours after the test.
测试样品表面温度不超过 170 °C，测试中与测试后 6 小时内无解体、无破裂、无起火。

T.7. Overcharge过充电

The state of samples 样品状态	No. 编号	OCV prior to test 试验前电压(V)	Status 结果
at first cycle, in fully charged states 在第一次循环完全充电状态	B05	43.33	Pass 合格
	B06	43.34	Pass 合格
	-	-	-
	-	-	-
after 25 cycles ending in fully charged states 在25次循环结束后完全充电状态	B07	43.32	Pass 合格
	B08	43.32	Pass 合格
	-	-	-
	-	-	-

Notes 注释: Ambient temperature 环境温度: 23.8 ℃
There is no disassembly and no fire during the test and within seven days after the test.
样品在测试中和测试后 7 天内无解体、无起火。

T.8. Forced discharge强制放电

The state of samples 样品状态	No. 编号	OCV prior to test 试验前电压(V)	Status 结果
at first cycle, in fully discharged states 在第一次循环完全放电状态	C11	2.679	Pass 合格
	C12	2.679	Pass 合格
	C13	2.668	Pass 合格
	C14	2.672	Pass 合格
	C15	2.668	Pass 合格
	C16	2.669	Pass 合格
	C17	2.679	Pass 合格
	C18	2.665	Pass 合格
	C19	2.681	Pass 合格
	C20	2.698	Pass 合格
after 25 cycles ending in fully discharged states 在25次循环结束后完全放电状态	C21	2.701	Pass 合格
	C22	2.687	Pass 合格
	C23	2.689	Pass 合格
	C24	2.688	Pass 合格
	C25	2.694	Pass 合格
	C26	2.674	Pass 合格
	C27	2.685	Pass 合格
	C28	2.678	Pass 合格
	C29	2.712	Pass 合格
	C30	2.695	Pass 合格

Notes 注释: Ambient temperature 环境温度: 23.8℃
There is no disassembly and no fire during the test and within seven days after the test.
样品在测试中和测试后 7 天内无解体、无起火。

样品图片
Photo Documentation

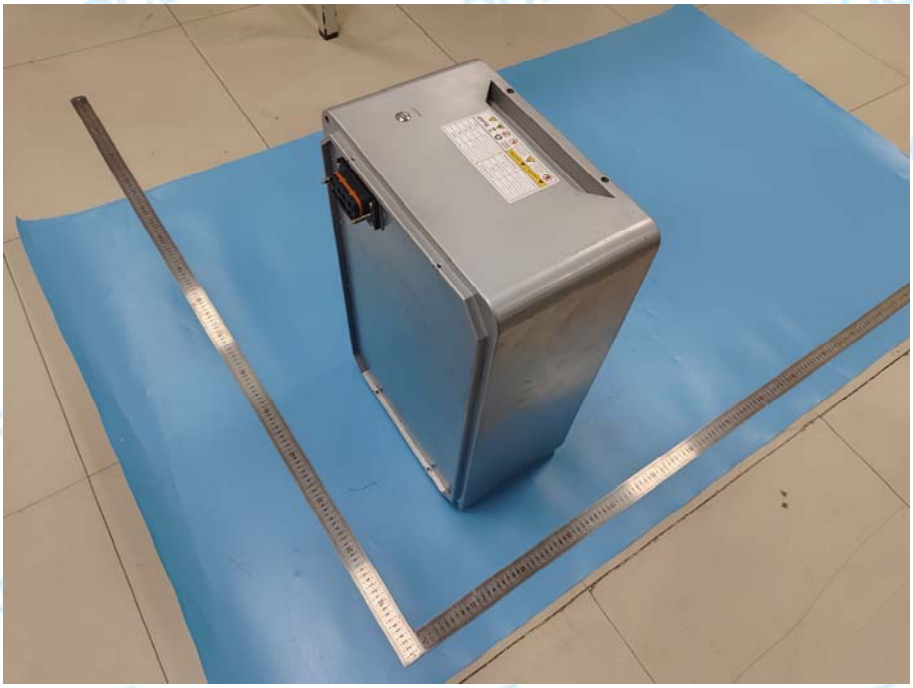

Fig.1 Front view of Storage Battery
光储充电池正面

Fig.2 back view of Storage Battery
光储充电池背面

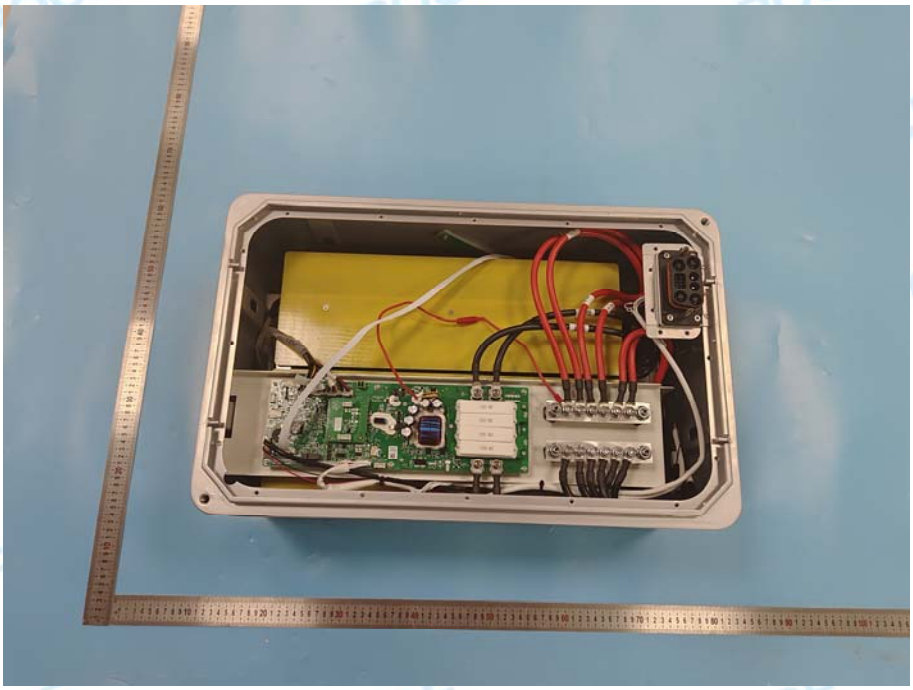

Fig.3 Internal view of Storage Battery
光储充电池内部

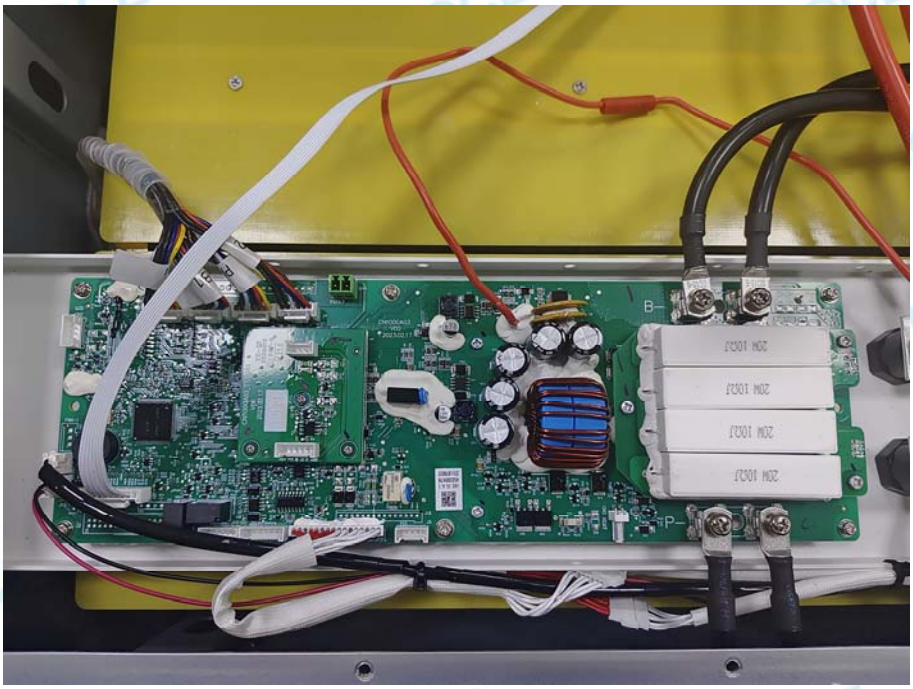

Fig.3 Internal view of Storage Battery
光储充电池电池内部

Battery Type	LiFeP04 Battery	Battery Capacity	100Ah
Battery Model	PD05	Charge Voltage	56V
Battery Power	5.12KWh	Discharge Voltage	46V
Battery Voltage	51.2V	Charge Current	≤100A
Communication	CANBUS/RS485	Discharge Current	≤100A

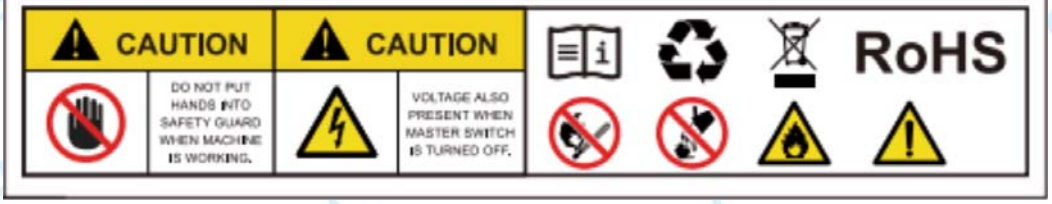

Fig.5 label
标签

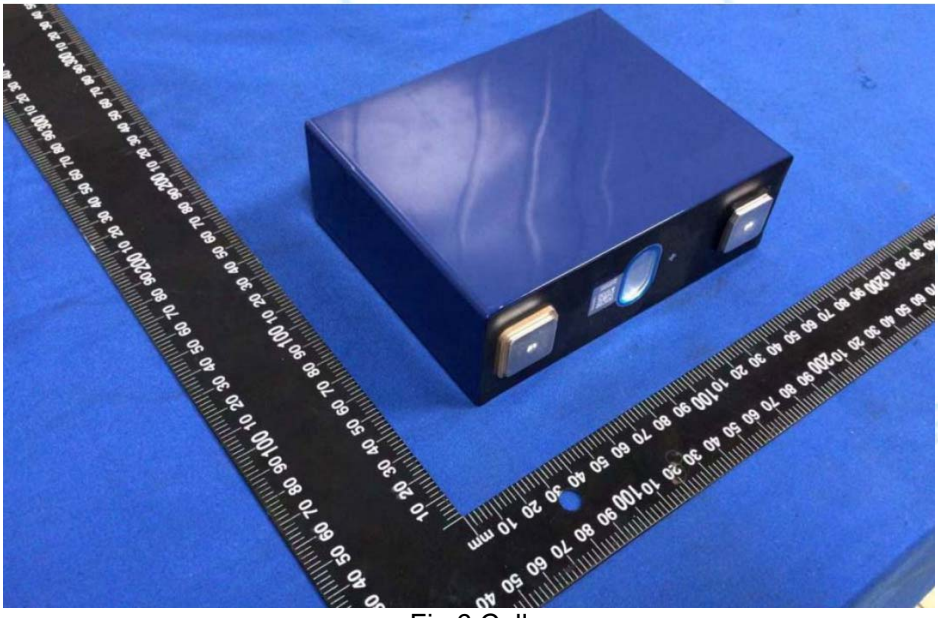

Fig.6 Cell
电芯

试验仪器设备清单
Test Equipment List

序号 No.	编号 Code	名称 Equipment name	型号 Type	本次使用 Used（√）
1.	POCE-SY-113-01	电池性能测试系统	CTS-20V/3A	（√）
2.	POCE-SY-113-02	高精度电池性能测试系统	BTS-60V40A	（√）
3.	POCE-SY-105	电池低压高空模拟试验箱	GX-3020-Z	（√）
4.	POCE-SY-213	可编程直流电源	62012P-80-60	（√）
5.	POCE-SY-165	恒温恒湿箱	BP-2259	（√）
6.	POCE-SY-111	电动振动试验系统	ES-2	（√）
7.	POCE-SY-110	机械式冲击试验机	HSKT10	（√）
8.	POCE-SY-1121	电池短路试验机	GX-6055-B	（√）
9.	POCE-SY-164	电热鼓风干燥箱	9070	（√）
10.	POCE-SY-155	数字万用表	12E+	（√）
11.	POCE-SY-100	热冲击试验箱	GX-6055-B	（ ）
12.	POCE-SY-103	电池重物冲击试验机	GX-5066	（ ）
13.	POCE-SY-037	直流电源	RXN-3010D	（√）
14.	POCE-SY-015	直流电子负载机	IT8511+	（√）
15.	POCE-SY-106	电池强制内部短路试验机	GX-6055-C	（ ）
16.	POCE-SY-117	电池内阻测试仪	AT520M	（ ）
17.	POCE-SY-0283	电子天平	JX-5003F/500g	（ ）
18.	POCE-SY-056	电子天平	TSC-150	（√ ）
19.	POCE-SY-25944	电子天平	MTB 2000/2kg	（ ）
20.	POCE-SY-009-1	数显温湿度计	CTH-608	（ ）
21.	POCE-SY-102	电池挤压试验机	GX-5067-C	（√）
22.	POCE-SY-012-2	多路温度采集器	AT4532	（√）

注：以上仪器设备均在计量校准周期内。

Notes: The equipment in above are within valid calibration period.

声 明
Statement

1、本报告无本单位报告专用章和批准人签章无效。

This report is invalid without the special seal for report of POCE and the signatures of approver.

2、本报告涂改和删除无效。

This report is invalid if is blotted out and deleted.

3、委托单位对检测结果有异议，应于收到报告之日起十五日内向我司提出。

If the applicant has any questions about results, shall submit to POCE within 15 days.

4、本报告仅对客户所送样品负责。

This report is responsible for the sample provided by the client only.

5、未经本单位许可，不得部分复制、摘用本报告书内容。

This report shall not be reproduced except in full, or extracted, without the written approval of POCE.

6、客户必须如实提供样品及资料，否则本单位不承担任何相关责任。

The client should provide true samples and relevant data, otherwise we will not bear any relevant responsibilities.

--测试报告结束--

--End of test report--

锂电池 或 锂电池组 UN38.3 试验概要
Lithium Cell or Battery UN38.3 Test Summary

单位信息 Company information:

委托单位名称&地址 Applicant name &address	惠州市华阳光电技术有限公司 HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.	
	广东省惠州市东江高新科技产业园上霞北路 1 号华阳工业园 B 区 6 号楼 Building No.6, Foryou Industrial Park Area B, No.1 North Shangxia Road, Dongjiang High-tech Industry Park, Huizhou, Guangdong, China.	
制造商 Manufacturer	名称 Name	惠州市华阳光电技术有限公司 HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.
	地址Address	广东省惠州市东江高新科技产业园上霞北路 1 号华阳工业园 B 区 6 号楼 Building No.6, Foryou Industrial Park Area B, No.1 North Shangxia Road, Dongjiang High-tech Industry Park, Huizhou, Guangdong, China.
	电话 Tel.	13554953985
	邮箱 E-mail	huyunqing0605@gmail.com
	网址 Website	/
测试实验室 Test laboratory	名称 Name	深圳宝测达科技有限公司 SHENZHEN POCE TECHNOLOGY CO.,LTD.
	地址 Address	深圳市宝安区石岩街道塘头社区宏发科技工业园 H1 栋 102、H 栋 1 层 H1 Building 102, H Building 1/F, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao'an District, Shenzhen, Guangdong, China
	电话 Tel.	+86-755-29113252
	邮箱 E-mail	Service@poce-cert.com
	网址 Website	http://www.poce-cert.com

样品信息 Sample information:

样品名称 Sample name	光储充电池 Storage Battery	样品型号 Sample model	PD05
商标 Trade Mark	ADAYO	标称电压 Nominal voltage	51.2V
样品质量 Sample mass	Approx(约)：48.3kg	额定瓦时 Watt-hour rating	5120Wh
		合计锂含量 Aggregate lithium content	N/A
电池或电池组类型 cell or battery type	锂电池组 Lithium-ion battery	物理形状 Physical description:	长方体 Cuboid
UN38.3报告编号 UN38.3 report No.	POCE240514020RL001	测试报告日期 Date of test report	May 16, 2024

测试标准 Test standard

《联合国关于危险品运输的建议书 试验和标准手册》第七版 第III部分 38.3章节 United nations "recommendations on the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria (ST/SG/AC.10/11/Rev.7 Part III Section 38.3)

测试项目及结论 Test item & conclusion

测试项目 Test item	结论 Conclusion	测试项目 Test item	结论 Conclusion
T1：高度模拟 Altitude Simulation	合格Pass	T5：外部短路 External short circuit	合格Pass
T2：温度试验 Thermal test	合格Pass	T6：挤压 Crush	合格Pass
T3：振动 Vibration	合格Pass	T7：过度充电 Overcharge	合格Pass
T4：冲击 Shock	合格Pass	T8：强制放电 Forced discharge	合格Pass
38.3.3（f）	不适用 Not Applicable	38.3.3（g）	不适用 Not Applicable
备注Remark	---		
签名 Signature	钱清东	签发日期：May 15, 2024 Issue date	
职务 Title	实验室经理 Lab Manager		

SHEN ZHEN POCE TECHNOLOGY CO.,LTD APPROVED

--试验概要结束--

--End of test Summary--