




ATTESTATION of conformity with European Directives



Attestation Number: 2088AB0109N021001
Product: Rechargeable Li-ion Battery
Brand Name: **AMASSTORE**
Model: GTX5000
Additional Models: N/A
Applicant: Shenzhen SOFAR SOLAR Co., Ltd.
Address: 401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community, XinAn Street, BaoAn District, Shenzhen, Guangdong. P.R.China.
Technical Characteristics: DC 51.2V, 100Ah, 5120Wh from Battery
Charging: DC 56.16V 50A Max
Discharging: DC 51.2V 75A Max

The submitted sample of the above equipment has been tested for  marking according to following European Directive and standards:

- Electromagnetic Compatibility Directive 2014/30/EU

Standards	Report Number	Report date
EN 55032:2015, CLASS B EN 55035:2017	CE200109N021-1	Jul. 03, 2020
EN 61000-6-3:2007 + A1:2011 + AC:2012 EN 61000-6-2:2005	CE200109N021-2	Jul. 03, 2020

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive.

This verification does not imply assessment of the production of the product. The  marking may be affixed if all relevant and effective European Directives with  are applicable.

Assistant Manager
EMC Department



Name: Madison Luo
Date: Jul. 03, 2020

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Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.
Information given in this document is related to the tested specimen of the described electrical sample.



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检测
TESTING
CNA SL5998



TEST REPORT UN38.3, Sixth Edition Recommendations on transport of dangerous goods, manual of test and criteria, Section 38.3 - Lithium metal and lithium ion Batteries	
Report Reference No.....	PNS20070021 01001
Date of issue	2020-07-17
Total number of pages	13 pages
Testing Laboratory 检测单位	GUANGDONG UTL CO., LTD. 广东联鼎检测科技有限公司
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Approved by (name + signature).....	Sophie Wu/Chief Engineer 吴娟/主管工程师 
Applicant's name..... 申请者	Shenzhen SOFAR SOLAR Co., Ltd. 深圳市首航新能源有限公司
Address	401, Building 4, Antongda Industrial Park, District 68, Xingdong Community, Xinan Street, Baoan District, Shenzhen, Guangdong. P.R. China 广东省深圳市宝安区新安街道兴东社区68区安通达工业厂区4栋厂房401
Factory's name 生产厂	Dongguan SOFAR SOLAR Co., Ltd. 东莞首航新能源有限公司
Address	1F-6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City. P.R. China 广东省东莞市凤岗镇五联村碧湖工业区金麟路一号E栋1至6层
Phone number/联系方式.....	+86-755-26526757
Email/邮件地址.....	wanghai@sofarsolar.com
Website/网址.....	http://cn.sofarsolar.com/
Test specification/测试规范	
Standard	ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3
Test procedure	N/A
Non-standard test method.....	N/A
Test item description/样品名称	Rechargeable Li-ion Battery / 可充电锂离子电池
Trade Mark/商标.....	
Model/Type reference/型号	GTX5000
Ratings/规格	51.2V, 100Ah, 5120Wh

List of Attachments (including a total number of pages in each attachment):

附件清单 (含每个附件的总页数):

- Photos documentation (2 pages)
- 产品图片 (2页)

Summary of testing:

测试信息概要:

Test Conclusion 测试结论		
Test(s) 测试项目	Sample Number 样品编号	Conclusion 单项结论
T.1: Altitude simulation / 高度模拟	b1# - b4#	Pass / 通过
T.2: Thermal test / 温度试验		Pass / 通过
T.3: Vibration / 振动		Pass / 通过
T.4: Shock / 冲击		Pass / 通过
T.5: External short circuit / 外部短路		Pass / 通过
T.6: Crush / 挤压	c1# - c10#	Pass / 通过
T.7: Overcharge / 过充电	b1# - b4#	Pass / 通过
T.8: Forced discharge / 强制放电	c11# - c30#	Pass / 通过

Comments: This report is based on 20PNS030091 03001 (Date of issue: 2020-04-02), change the sample label.

注释: 此报告基于20PNS030091 03001 (发行时间: 2020-04-02), 更改样品标贴。

The sample's status is good.

样品状况良好。

The conditions of the batteries of samples No. b1# to b2# are at first cycle, in fully charged states.

样品编号b1# -b2#为第一次循环充放电周期后完全充电状态的电池。

The conditions of the batteries of samples No. b3# to b4# are after twenty-fifth cycles ending in fully charged states.

样品编号b3# -b4#为二十五次循环充放电周期后完全充电状态的电池。

The conditions of the cells of samples No. c1# to c5# are at first cycle at 50% of the design rated capacity.

样品编号c1# -c5#为第一次循环充放电周期充电至标称容量的50%状态的电芯。

The conditions of the cells of samples No. c6# to c10# are after twenty-fifth cycles ending at 50% of the design rated capacity.

样品编号c6# -c10#为第二十五次循环充放电周期充电至标称容量的50%状态的电芯。

The conditions of the cells of samples No. c11# to c20# are at first cycle, in fully discharged states.

样品编号c11# -c20#为第一次循环充放电周期完全放电状态的电芯。

The conditions of the cells of samples No. c21# to c30# are after twenty-fifth cycles ending in fully discharged states.

样品编号c21# -c30#为二十五次循环充放电周期后完全放电状态的电芯。

The test results: Pass

测试结果: 通过

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Test item particulars	
样品信息	
Cell type	001CB270
电芯型号	
Nominal Voltage of cell	3.2V
电芯额定电压	
Rated Capacity of cell	100Ah
电芯额定容量	
Battery Type	Lithium-ion Battery
电池类型	锂离子电池
Appearance	White+Black
颜色	白色+黑色
Number of cell	16pcs (16S1P)
电芯数量	
Dimension(mm)	480.0mm(max) × 211.5mm(max) × 605.0mm(max)
尺寸	
Test case verdicts	
测试判定	
Test case does not apply to the test object	N/A
判定不适用于测试对象	
Test item does meet the requirement	P(Pass)
测试符合规定	
Test item does not meet the requirement	F(Fail)
测试不符合规定	
Testing 测试	
Date of receipt of test item	2020-03-11
接样日期	
Date(s) of performance of test	2020-03-13 ~ 2020-03-31
测试周期	
General remarks 备注	
This report shall not be reproduced, except in full, without the written approval of the testing laboratory. 除非全部复制，未经本实验室书面批准本报告不得部分复制。	
The test results presented in this report relate only to the item tested. 本报告的测试结果仅对送检样品负责。	
“(see remark #)” refers to a remark appended to the report. “(见注#)”指报告的备注。	
Throughout this report a point is used as the decimal separator. 本报告中以点作为小数点分隔符。	
According to the Standard, a single-cell battery (Battery Pack) is considered a “Cell” (Battery Cell) and shall be tested according to the testing requirements for “Cell”. This testing included the samples of Battery Pack and Battery Cell as aforementioned. For testing details, please refer to Table of Test Conclusion and individual test record. 按照标准要求，单电芯电池(电池包)被视作“电芯”(电池芯)，以“电芯”的要求进行测试，本测试项目样品包含如前所述电池包和电池芯。有关测试详情，请查阅测试结论表格及各单项测试记录。	

General product information:**产品信息:**

The main features of this model are shown as below:

产品主要信息如下:

Model 型号	Nominal capacity 额定容量	Nominal voltage 额定电压	Nominal Charge Current 额定充电电流	Nominal Discharge Current 额定放电电流	Maximum Charge Current 最大充电电流	Maximum Discharge Current 最大放电电流	Maximum Charge Voltage 最大充电电压	Cut-off Voltage 放电截止电压
Battery/ 电池								
GTX5000	100Ah	51.2V	50A	50A	50A	75A	56.16V	45.6V
Cell/ 电芯								
001CB270	100Ah	3.2V	50A	50A	100A	120A	3.65V	2.0V

Test Procedure:**测试程序:**

1. Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells. 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.

测试T.1-T.5须按顺序依次在同一组电芯或电池上进行。T.6和T.8须用全新的电芯进行测试。T.7 可以用之前T.1-T.5测试中完整无损的电池进行测试。

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

质量损失按照如下公式计算:

$$\text{Mass loss (\%)} = \frac{(M1 - M2)}{M1} \times 100$$

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 Table 38.3.1, it shall be considered as “no mass loss”.

M1是测试前的重量，M2是测试后的重量。若质量损失不超过Table 38.3.1中的值即可视为“没有质量损失”。

Table 38.3.1 Mass loss limit

Mass M of cell or battery	Mass loss limit
M < 1 g	0.5%
1 g ≤ M ≤ 75 g	0.2%
M > 75 g	0.1%

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UN 38.3			
Clause	Requirement + Test	Result - Remark	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的环境中贮存至少6个小时。		P
	Cells and 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 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：无漏液、无排气、无解体、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 leakage, no venting, no disassembly, no rupture and no fire. / 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. / 测试数据见表1。	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。		P
	For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours. /对于大电芯和大电池，在高温和低温中放置的时间最少12个小时。		P
	Cells and 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 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：无漏液、无排气、无解体、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 leakage, no venting, no disassembly, no rupture and no fire. / 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. / 测试数据见表1。	P

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UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
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分钟的对数前移传送。对样品从三个互相垂直的方向上循环12次，每个方向3个小时，共9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
	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

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UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	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：无漏液、无排气、无解体、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 leakage, no venting, no disassembly, no rupture and no fire. / 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. / 测试数据见表1。	P
38.3.4.4	Test T.4: Shock/冲击		P
	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. /以稳固的托架固定住每个样品。		P
	Shock: a half-sine shock of peak acceleration of $150 g_n$ (or Acceleration(g_n)= $\sqrt{\frac{100850}{mass}}$, which is smaller) and pulse duration of 6 milliseconds, large cells and large batteries shall be subjected to a half-sine or peak acceleration of $50 g_n$ (or Acceleration(g_n)= $\sqrt{\frac{30000}{mass}}$, which is smaller) and pulse duration of 11 milliseconds/对小电芯或小电池以峰值为150 g_n (或与 $\sqrt{\frac{100850}{mass}}$ 中的较小值) 的半正弦的加速度撞击，脉冲持续6毫秒，大电芯和大电池组须经受最大加速度50 g_n (或与 $\sqrt{\frac{30000}{mass}}$ 中的较小值) 和脉冲持续时间11毫秒的半正弦波冲击。	Large battery/大电池组.	P
	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. /每个样品必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

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	Cells and 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 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：无漏液、无排气、无解体、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 leakage, no venting, no disassembly, no rupture and no fire. / 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. / 测试数据见表1。	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 temperature stabilized so that its external case temperature reaches $57\pm4^{\circ}\text{C}$. / 保持测试环境温度稳定在 $57\pm4^{\circ}\text{C}$ ，以便样品外表温度达到 $57\pm4^{\circ}\text{C}$ 。		P
	The cell or battery at $57 \pm 4^{\circ}\text{C}$ 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 $57\pm4^{\circ}\text{C}$, 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. / 在环境温度 $57\pm4^{\circ}\text{C}$ 的条件下，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 $57\pm4^{\circ}\text{C}$ 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。		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 ，并且无解体、无破裂和无着火现象发生。	No disassembly, no rupture and no fire. / 无解体、无破裂以及无着火现象发生。 The data see table 1. / 测试数据见表1。	P
38.3.4.6	Test T.6: Impact / Crush/撞击/挤压		P
	Test procedure – Impact (applicable to cylindrical cells not less than 18.0mm in diameter) / 撞击(适合于直径大于等于18.0mm的圆柱形电芯)	Prismatic cell/ 棱柱形电芯	N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8mm±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 less than 18.0mm in diameter). /挤压 (适用于棱柱形、袋状、硬币/纽扣电芯和直径小于18.0mm的圆柱形电芯)	Prismatic cell/ 棱柱形电芯	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 the first 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 13 kN±0.78 kN; /施加力达到13 kN±0.78 kN		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

UN 38.3			
Clause	Requirement + Test	Result - Remark	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。		P
	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，并且无解体和无着火现象发生。	No disassembly and no fire. /无解体，无着火现象发生。 The data see table 2. /测试数据见表2。	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
	(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。	The voltage of the test is 67.392V, and the current is 100A. /测试电压为67.392V，电流为100A。	P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	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，样品无解体和无着火现象。	No disassembly and no fire. /无解体，无着火现象发生。 The data see table 3./测试数据见表3。	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，样品无解体和无着火现象发生。	No disassembly and no fire. /无解体和无着火现象发生。 The data see table 4. / 测试数据见表4。	P

Tables

Table 1: T.1~T.5 / 表1. 测试 1~测试 5											
Sample No. 样品编号	Mass prior to test (kg)/测试前质量	OCV prior to test (V)/ 测试前开路电压	Test 1: Altitude simulation/ 测试 1: 高度模拟		Test 2: Thermal test/ 测试 2: 温度试验		Test 3: Vibration/ 测试 3: 振动		Test 4: Shock/ 测试 4: 冲击		Test 5: External Short Circuit/ 测试 5: 外部短路
			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(%)	
b1#	54.932	55.771	0.000	99.996	0.000	99.979	0.000	99.996	0.000	99.996	Temp. (°C) 温度(°C)
b2#	54.891	55.794	0.000	99.998	0.000	99.979	0.000	99.998	0.000	99.996	57.2
b3#	54.911	55.796	0.000	99.998	0.001	99.979	0.000	99.998	0.000	99.996	57.5
b4#	54.985	55.782	0.000	99.998	0.001	99.982	0.000	99.996	0.000	99.998	57.4

Tables

Table 2: Crush / 表2: 挤压											
Test 6: Crush 测试6: 挤压	Sample No. 样品编号	c1#	c2#	c3#	c4#	c5#	c6#	c7#	c8#	c9#	c10#
	OCV prior to test/ 测试前开路电压(V)	3.296	3.294	3.297	3.296	3.295	3.296	3.294	3.295	3.294	3.295
	Temp. (°C) 温度(°C)	24.1	24.0	23.8	23.7	24.0	24.1	23.8	23.7	23.9	23.8

Test 7: Overcharge 测试7: 过充电	Sample No. 样品编号	b1#	b2#	b3#	b4#
	OCV prior to test/ 测试前开路电压(V)	55.787	55.768	55.773	55.789

Table 4 : Forced discharge / 表4: 强制放电											
Test 8: Forced discharge 测试8: 强制放电	Sample No. 样品编号	c11#	c12#	c13#	c14#	c15#	c16#	c17#	c18#	c19#	c20#
	OCV prior to test/ 测试前开路电压(V)	3.138	3.136	3.142	3.139	3.145	3.158	3.149	3.150	3.148	3.159
	Sample No. 样品编号	c21#	c22#	c23#	C24#	c25#	c26#	c27#	c28#	c29#	c30#
	OCV prior to test/ 测试前开路电压(V)	3.161	3.159	3.163	3.154	3.158	3.160	3.152	3.146	3.151	3.147

Photos



Figure 1 Overall view I of battery



Figure 2 Overall view II of battery

Photos

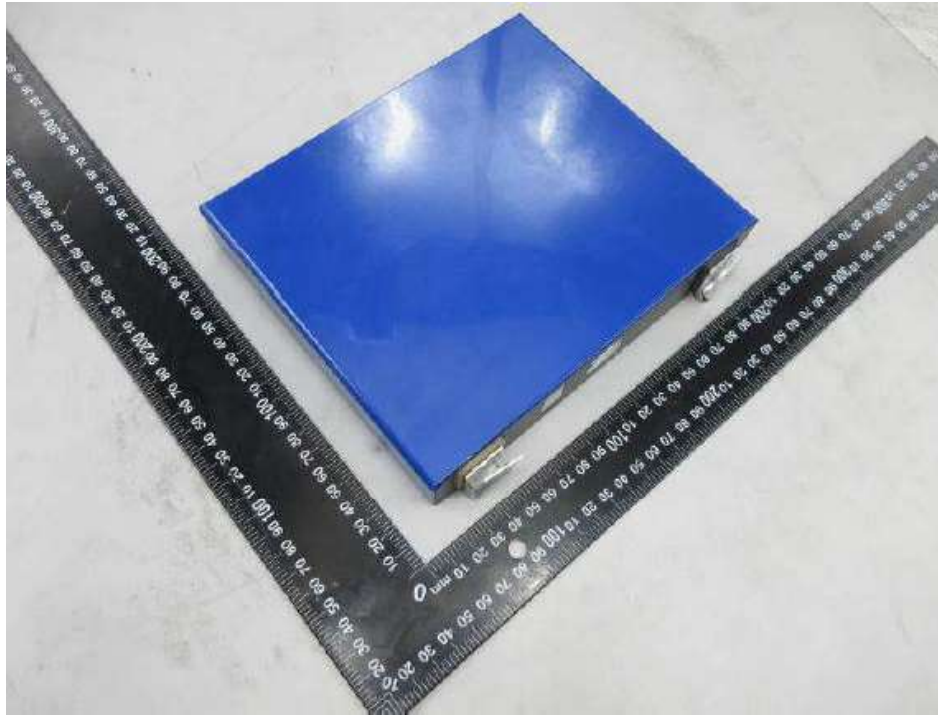


Figure 3 Overall view of cell



Figure 4 Battery Label

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Lithium Cells or Battery Test Summary 锂电池或锂电池组测试概要



Battery Factory / 电池生产商:	Dongguan SOFAR SOLAR Co., Ltd. 东莞首航新能源有限公司
Battery Factory Address / 电池生产商地址:	1F-6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City. P.R. China 广东省东莞市凤岗镇五联村碧湖工业区金麟路一号E栋1至6层
Phone number / 联系电话:	+86-755-26526757
E-mail / 电子邮箱:	wanghui@sofarsolar.com
Website / 公司网址:	http://cn.sofarsolar.com

Battery Type / 电池类型:	Lithium-ion Battery / 锂离子电池
Battery Rating / 电池参数:	51.2V, 100Ah
Battery Physical description / 电池描述:	White+Black / 白色+黑色, Quadrate shape / 方形, 16S1P
Battery Model / 电池型号:	GTX5000
Battery Weight / 电池重量(g):	55000g
Battery Watt-hour Rating / 电池瓦时(Wh):	5120Wh
Battery Lithium content / 锂金属含量(g):	--

Above Lithium cells or battery have been successfully tested and comply with the UN Manual of Tests and Criteria Part III Subsection 38.3, Rev.6/Amend.1. Test information as below:

上述电池已经通过测试并通过联合国《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修正1, 38.3 节: 锂电池. 测试信息如下:

Test Items / 测试项目		Result / 测试结果
38.3.4.1	T.1: Altitude simulation / 高度模拟	Pass / 通过
38.3.4.2	T.2: Thermal test / 温度测试	Pass / 通过
38.3.4.3	T.3: Vibration / 振动测试	Pass / 通过
38.3.4.4	T.4: Shock / 冲击测试	Pass / 通过
38.3.4.5	T.5: External short circuit / 外部短路	Pass / 通过
38.3.4.6	T.6: Crush / 挤压	Pass / 通过
38.3.4.7	T.7: Overcharge / 过充电	Pass / 通过
38.3.4.8	T.8: Forced discharge / 强制放电	Pass / 通过

* Not Applicable for 38.3.3(f), 38.3.3(g) / 不适用 38.3.3(f), 38.3.3(g) 测试要求

As shown in the Test Report Ref. No. which form part of this test summary / 如下测试报告是本测试概要的一部分

Test Report Number / 测试报告号码:	PNS20070021 01001	Issued Date / 发布日期:	2020-07-17
Test laboratory / 测试实验室:	GUANGDONG UTL CO., LTD. 广东联鼎检测科技有限公司		
Test laboratory address / 测试实验室地址:	Liangding Testing Building, No.18 Center Road of Yayuan Industrial Zone, Nancheng District, Dongguan, Guangdong, China. 东莞市南城街道雅园工业区中心路18号联鼎检测大厦		
Test Summary information Prepared by / 测试概要出具:		Approved by / 批准:	
Sunny Yan / Project Engineer 鄢倩倩 / 项目工程师		Sophie Wu / Chief Engineer 吴娟 / 主管工程师	
			

GUANGDONG UTL CO. LTD. (广东联鼎检测科技有限公司)

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材料安全数据表

Material Safety Data Sheet

货 物 名 称:	可充电锂离子电池
Name of Goods:	Rechargeable Li-ion Battery
委 托 单 位:	深圳市首航新能源有限公司
Commissioner:	Shenzhen SOFAR SOLAR Co., Ltd.

广东联鼎检测科技有限公司
GUANGDONG UTL CO., LTD.

材料安全数据表

Material Safety Data Sheet

1. Identification of the product and supplier (产品和厂商信息)	
样品名称 Name of goods	可充电锂离子电池 Rechargeable Li-ion Battery
样品型号 Type/Model	GTX5000
规格 Rating	51.2V, 100Ah, 5120Wh
委托单位 Commissioned by	深圳市首航新能源有限公司 Shenzhen SOFAR SOLAR Co., Ltd.
委托单位地址 Commissioner address	广东省深圳市宝安区新安街道兴东社区68区安通达工业厂区4栋厂房401 401, Building 4, Antongda Industrial Park, District 68, Xingdong Community, Xinan Street, Baoan District, Shenzhen, Guangdong. P.R. China
生产厂 Factory's name	东莞首航新能源有限公司 Dongguan SOFAR SOLAR Co., Ltd.
生产厂地址 Factory address	广东省东莞市凤岗镇五联村碧湖工业区金麟路一号E栋1至6层 1F-6F, Building E, No. 1 JinQi Road, Bihu Industrial Park, Wulian Village, Fenggang Town, Dongguan City. P.R. China
鉴定依据 Inspection according to	EEC Directive 93/112/EC 联合国《关于危险品货物运输的建议书》 UN "Recommendations on the TRANSPORT OF DANGEROUS GOODS"
紧急联系电话 Emergency telephone call	+86-755-26526757
接样日期 / Receiving date: 2020-07-01	签发日期 / Issue date: 2020-07-17

Approved by: 吴娟 Reviewed by: 吴顺端 Tested by: 郭倩倩
批 准: 审 核: 主 检:

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2. Composition Information (成分/组成信息)

化学成分 Chemical Composition	化学式 Chemical Formula	重量百分比 Weight(%)	CAS编号 CAS Number
石墨/ Graphite	$C_{24}X_{12}$	7-25	7782-42-5
磷酸铁锂/ Lithium Iron Phosphate Carbon Coated	$LiFePO_4$	15-40	15365-14-7
聚偏二氟乙烯共六氟丙烯/ Poly(vinylidene fluoride co- hexafluoropropylene)	$C_{21}H_{22}Cl_9N_3O_2$	3-15	9011-17-0
六氟磷酸锂/ Lithium Hexafluorophosphate	$LiPF_6$	0-5	21324-40-3
炭黑/ Carbon Nanotubes	C	0-2	1333-86-4
碳酸二乙酯/ Diethyl Carbonate	$C_5H_{10}O_3$	0-15	105-58-8
碳酸二甲酯/ Dimethyl Carbonate	$C_3H_6O_3$	0-15	616-38-6
碳酸甲乙酯/ Methyl Ethyl Carbonate	$C_4H_8O_3$	0-15	623-53-0
碳酸丙烯酯/ Propylene Carbonate	$C_4H_6O_3$	0-15	108-32-7
碳酸乙烯酯/ Ethylene Carbonate	$C_3H_4O_3$	0-15	96-49-1

3. Hazards Identification (危险性概述)

爆炸危险性 Explosive risk	该物品不属于爆炸危险品 This article does not belong to the explosion dangerous goods
易燃危险性 Flammable risk	该物品不属于易燃危险品 This article does not belong to the flammable material
氧化危险性 Oxidation risk	该物品不属于氧化危险品 This article does not belong to the oxidation of dangerous goods
毒害危险性 Toxic risk	该物品不属于毒害危险品 This article does not belong to the toxic dangerous goods
放射危险性 Radioactive risk	该物品不属于放射危险品 This article does not belong to the radiation of dangerous goods
腐蚀危险性 Mordant risk	该物品不属于腐蚀危险品 This article does not belong to the corrosion of dangerous goods
其他危险性 other risk	该电池瓦时率为5120Wh, 属于第九类危险品货物。 Watt hour rate 5120Wh, which belong to the Class 9 of dangerous goods.

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4. First aid measures (急救措施)

眼睛:

万一接触, 立即用大量的清水冲洗至少15 分钟, 翻起上下眼睑, 直到化学的残留物消失为止, 迅速就医.

Eye

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

皮肤:

万一接触, 用大量水冲洗至少15 分钟, 同时除去污染的衣物和鞋子, 迅速就医。

Skin

Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

吸入:

立即从暴露处移至空气清新处, 如果呼吸困难给予输氧, 立即就医。

Inhalation

Remove from exposure and move to fresh air immediately. Use oxygen if available.

食入:

引用两杯牛奶或水。如果当事人仍然清晰可以采取催吐的方法, 并且立即就医。

Ingestion

Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician.

5. Fire-fighting measures (消防措施)

燃点: 不适用

Flash Point: N/A.

自燃温度: 不适用

Auto-Ignition Temperature: N/A.

灭火介质: 大量水(降温), 二氧化碳

Extinguishing Media: Water, CO2.

特殊灭火程序: 自给式呼吸器

Special Fire-Fighting Procedures: Self-contained breathing apparatus.

异常火灾或爆炸: 当电芯暴露于过热的环境中时, 安全阀可能会打开。

Unusual Fire and Explosion Hazards:

Cell may vent when subjected to excessive heat-exposing battery contents.

燃烧产生的危险物品: 一氧化碳, 二氧化碳, 锂氧化物烟气

Hazardous Combustion Products: Carbon monoxide, carbon dioxide, lithium oxide fumes.

6. Accidental release measures (泄漏应急处理)

为防止电池材料泄露或释放采取的措施

如果电池内部材料泄露，试验人员应立即撤离试验区直到烟气消散。将通风设备打开吹散危险性气体。用抹布擦净试验区，清除溢出的液体，将泄露电池放进塑料袋中，然后放进钢制容器。避免皮肤和眼睛接触或吸入有害气体。

Steps to be Taken in case Material is Released or Spilled

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

废弃物处置方法

建议将电池完全放电，消耗电池内部的锂金属，并且深埋于土壤中。

Waste Disposal Method

It is recommended to discharge the battery to the end, to use up the metal lithium inside the battery, and to bury the discharged battery in soil.

7. Handling and storage (操作处置和储存)

禁止打开、毁坏或焚烧电池，因为电池有可能在这些处理过程中发生爆炸、破裂或泄露等事故。

禁止将电池短路、过充、强制放电或扔入火中。禁止挤压刺穿电池或将电池浸入溶液中。

The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container.

Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire.

Do not crush or puncture the battery, or immerse in liquids.

操作处置和储存中的防范措施

禁止物理或电滥用，禁止高温储存，最好将电池储存在阴凉、干燥、通风及温度变化较小的环境中。

禁止将电池接触加热设备或将电池直接暴露与阳光中。

Precautions to be taken in handling and storing

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

其他要注意的防范措施

拆解、挤压、直接放入火中或高温条件下，电池可能发生爆炸和燃烧。禁止短接或将电池正负极错误的安装在设备中。

Other Precautions

The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

8. Exposure controls/personal protection (接触控制/个人防护)

呼吸防护

当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操

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作条件下，呼吸保护是不必要的。

Respiratory Protection

In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.

通风条件

正常使用条件下不需要。

Ventilation

Not necessary under conditions of normal use.

防护手套

正常使用条件下不需要。

Protective Gloves

Not necessary under conditions of normal use.

其他防护服或设备

正常使用条件下不需要。

Other Protective Clothing or Equipment

Not necessary under conditions of normal use.

电池开阀试验时应做好个人防护

呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。

Personal Protection is recommended for venting battery

Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

9. Physical and chemical properties (物理和化学特性)

外观：方形

Appearance: Quadrate shape

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Ref. No.: PNS20070021 01001

气味：泄漏时，有醚的气味。

Odour: If leaking, smells of medical ether.

酸碱度：不适用。

pH: Not applicable as supplied.

燃点：除单个电芯暴露试验外其他不适用。

Flash Point: Not applicable unless individual components exposed.

可燃性：除单个电芯暴露试验外其他不适用。

Flammability: Not applicable unless individual components exposed.

相对密度：除单个电芯暴露试验外其他不适用。

Relative density: Not applicable unless individual components exposed.

溶解性（水溶性）：除单个电芯暴露试验外其他不适用。

Solubility (water): Not applicable unless individual components exposed.

溶解性（其他）：除单个电芯暴露试验外其他不适用。

Solubility (other): Not applicable unless individual components exposed.

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10. Stability and reactivity (稳定性和反应活性)

稳定性: 产品在第7节所述的条件下稳定。

Stability: Product is stable under conditions described in Section 7.

应避免的条件: 加热70°C以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路。

长时间暴露在潮湿的条件下。

Conditions to avoid: Heat above 70°C or incinerate. Deform. Mutilate. Crush. Disassemble. Overcharge. Short circuit. Expose over a long period to humid conditions.

应避免的材料: 氧化剂, 碱, 水。

Materials to avoid: Oxidising agents, alkalis, water.

危险分解物: 有毒烟雾, 并可能形成过氧化物。

Hazardous Decomposition Products: Toxic Fumes, and may form peroxides.

聚合危害: 不适用

Hazardous Polymerization: N/A.

如果发生泄露, 避免与强氧化剂, 无机酸, 强碱, 卤代烃接触。

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated hydrocarbons.

11. Toxicological information (毒理性资料)

标志及症状: 无, 除非电池破裂。

Signs & symptoms: None, unless battery ruptures.

内部物质暴露的情况下, 蒸汽烟雾可能对眼睛和皮肤的刺激性。

In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.

吸入: 对肺有刺激性。

Inhalation: Lung irritant.

皮肤接触: 对皮肤刺激性。

Skin contact: Skin irritant

眼睛接触: 对眼睛有刺激性。

Eye contact: Eye irritant

食入: 吞下中毒。

Ingestion: Poisoning if swallowed

下列情况下健康状况会恶化: 万一发生与电池内部材料接触的事故, 轻微或严重的刺激, 都可能使皮肤出现干燥和灼烧的感觉, 并且损坏靶器官(肝脏, 肾脏)的神经。

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, moderate to server irritation, burning and dryness of the skin may occur, Target organs nerves, liver and kidneys.

12. Ecological information (生态学资料)

对哺乳动物的影响: 目前未知。

Mammalian effects: None known at present.

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生态毒性: 目前未知。

Eco-toxicity: None known at present.

生物体内积累: 慢慢地生物降解。

Bioaccumulation potential: Slowly Bio-degradable.

环境危害: 目前没有已知的环境危害。

Environmental fate: None known environmental hazards at present.

13. Disposal consideration (废弃处置)

不要焚烧, 或使电池温度超过70°C, 这种滥用可导致泄漏和/或电池爆炸。按照相应的地方性法规处理。

Do not incinerate, or subject cells to temperature in excess of 70°C, Such abuse can result in loss of seal leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.

14. Transport information (运输信息)

运输标签: 第九类危险品标识

Label for conveyance: the Class 9—Lithium Battery hazard label

UN编号: UN3480

UN Number: UN3480

包装等级: Group II

Packing Group: Group II

EmS编号: F-A, S-I

EmS No: F-A, S-I

海洋污染物: 无

Marine pollutant: No

正确的装运名称: 锂离子电池(含锂离子聚合物电池)

Proper Shipping name: Lithium ion batteries (including Lithium ion polymer batteries)

危险分类: 货物应遵守IATA 第61版DGR手册包装说明965第IA节规定(2020年版), 和国际海运危险货物规则(Amdt. 39-18) 2018版, 包括通过UN38.3测试手册要求。

Hazard Classification: The goods shall be complied with the requirements of Section IA of Packing Instructions 965 of 61st DGR Manual of IATA (2020 Edition) and IMDG CODE (Amdt. 39-18) 2018 Edition, including the passing of the UN38.3 test.

15. Regulation information (法规信息)

法律信息

Law information

《危险物品规则》

《Dangerous Goods Regulations》

《对危险货物运输的有关规定的建议》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《国际海运危险货物规则》

《International Maritime Dangerous Goods》

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《危险品安全运输技术指令》
《Technical Instructions for the Safe Transport of Dangerous Goods》
《危险货物分类和品名编号》
《Classification and code of dangerous goods》
《职业安全卫生法》
《Occupational Safety and Health Act》(OSHA)
《有毒物质控制法》
《Toxic Substance Control Act》(TSCA)
《消费产品安全法》
《Consumer Product Safety Act》(CPSA)
《联邦环境污染控制法》
《Federal Environmental Pollution Control Act》(FEPCA)
《石油污染法案》
《The Oil Pollution Act》(OPA)
《超级基金修正案和再授权法案III(302/311/312/313)》
《Superfund Amendments and Reauthorization Act TitleIII (302/311/312/313)》(SARA)
《资源保护及恢复法案》
《Resource Conservation and Recovery Act》(RCRA)
《安全饮用水法》
《Safety Drinking Water Act》(CWA)
《加州65提案》
《California Proposition 65》
《美国联邦法规》
《Code of Federal Regulations》(CFR)

根据所有联邦、州和地方法律。

In accordance with all Federal, State and local laws.

16. Other information (其他信息)

本文件仅对由委托方深圳市首航新能源有限公司提供的，并由东莞首航新能源有限公司生产的电池(GTX5000)有效。该电池的成分信息由委托方提供并承诺其完整性和准确性。用户应仔细阅读此文件，并按照正确的方法使用电池，如因电池使用不当造成的损害或损失，广东联鼎检测科技有限公司(UTL)不承担任何责任。

This file is only effective to the batteries (GTX5000) provided by Shenzhen SOFAR SOLAR Co., Ltd. which manufactured by Dongguan SOFAR SOLAR Co., Ltd. The commissioner provides the composition information of batteries, and promises its integrity and accuracy. Users should read this file carefully, and use the batteries in correct method. GUANGDONG UTL CO., LTD. (UTL) doesn't assume responsibility for any damage or loss because of misuse of batteries.

Photos

Figure 1 Overall view I of battery (电池图I)



Figure 2 Overall view II of battery (电池图II)

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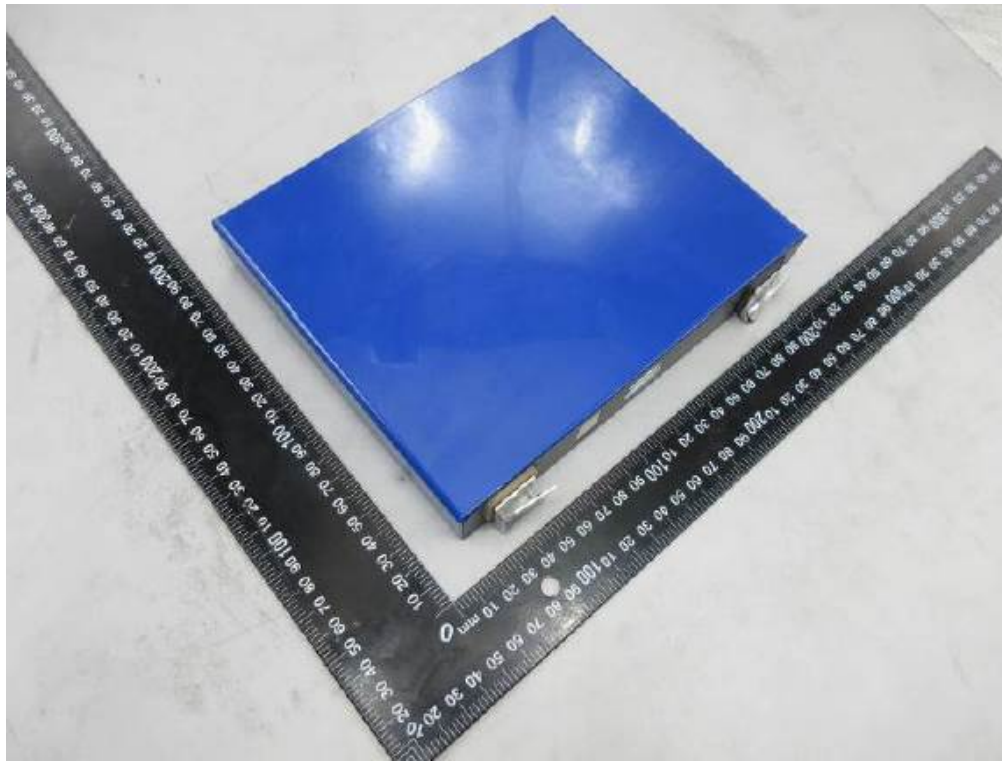


Figure 3 Overall view of cell (电芯图)



Figure 4 Battery Label (电池标签)