



东莞伟博电池科技有限公司
Dongguan Victory Battery Technology Co., Ltd

REV: A

地址: 广东省东莞市黄江镇田心村蝴蝶 2 路伟博科技园
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DATE:24.05.18

Specification Approval Sheet(Battery)
产品规格确认书(电池)

Model: S.119.0123.797

型号: S.119.0123.797

Prepared By/Date 编制/日期	Checked By/Date 审核/日期	Approved By/Date 批准/日期
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Customer Approval 客户批准	Company Name: 公司名称:	
	Company Stamp: 客户印章:	

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1、Scope

This specification is applied to the reference battery in this Specification and manufactured by Dongguan Victory Battery Technology Co.,Ltd.

适用范围

本说明书适用于本书中所提及的东莞伟博电池科技有限公司制造的电池组。

Model: **S.119.0123.797**

型号: **S.119.0123.797**

3、Technical Parameter 技术参数

No.	Items	Specifications
1	Charge voltage 充电电压	DC 16.8V
2	Nominal voltage 标称电压	14.4V
3	Nominal capacity 标称容量	10.2Ah
4	Minimal capacity 最小容量	10Ah @0.2C Discharge(放电)
5	Standard Charging method 标准充电方法	0.5C CC(constant current) charge to 16.8V, then CV(constant voltage 16.8V) charge till charge current decline to $\leq 0.02C$ 0.5C CC (恒流) 充电至 16.8V,再 CV (恒压 16.8V) 充电直至充电电流 $\leq 0.02C$.
6	Charge current 充电电流	Standard charge: 0.5C 标准充电: 0.5C Rapid charge: 1.0C 快速充电: 1.0C
7	Discharge current 放电电流	Standard discharge: 0.2C 标准放电: 0.2C Rapid discharge: 1C 快速放电: 1C
8	Discharge cut-off voltage 放电截止电压	11.2V
9	Operating temperature 工作温度	Charging: 0°C ~ 45°C 充电: 0°C ~ 45°C Discharging: -20°C ~60°C 放电: -20°C ~60°C
10	Storage temperature 储存温度	-20°C ~ + 45°C
11	Battery Weight 电池重量	Approx. 0.75Kg Below 约: 0.75Kg
12	Battery Dimension 电池尺寸	Length 长度: Max:121mm Width 宽度: Max:77mm Thickness 厚度: Max:67mm

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4、Cell Performance Criteria 电芯性能检查及测试

No.	测试项目 Test	测试方法与条件 Test Method and Condition	标准 Criteria
1	Standard Charge 标准充电	Charging the Battery initially with constant current at 0.5C and then with constant voltage 4.2V till charge current declines to 0.02C. 先用 0.5C 恒流充电至 4.2V，再恒压 4.2V 充电直至充电电流 $\leq 0.05C$ 。	N.A.
2	Initial Capacity 初始容量	The capacity means the discharge capacity of the Battery, which is measured in terms of discharge current of 0.2C and 2.5V cut-off voltage after the standard charge. 该容量是指标准充电后，0.2C 放电至 2.5V 截止电压所放出的容量。	$\geq 3400\text{mAh}$
3	Cycle Life 循环寿命	Test condition: Charge:1.5A to 4.2V Discharge:4A to 2.5V 80% or more of 1 st cycle capacity at 4A discharge of Operation 测试条件: 充电: 1.5A 充电到 4.2V 放电: 4A 放电到 2.5V 当放电容量降至初始容量的 80%时, 所完成的循环次数定义为该电池的循环寿命	≥ 400 cycles
4	Self-discharge 自放电	After the standard charging, store the Battery under the condition as No.4.4 for 30 days, then measured the capacity with 0.2C till 2.5V 标准充电后, 在 No.4.4 条件下贮存 30 天, 再以 0.2C 放电至 2.5V 所放出的容量。	Remaining capacity > 90% 剩余容量 > 90%
5	Initial Impedance 初始内阻	Internal resistance measured at AC 1KHz after 50% charge 半充状态下, 测量其 AC 1KHz 下的交流阻抗	$\leq 40\text{m}\Omega$
6	Battery Voltage 电池电压	As of shipment. 出货状态	3.5~3.6V

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5、电芯安全性能测试 CELL PERFORMANCE

测试项目 Test	单位 Unit	规格 Specification	条件 Condition
过充测试 Over charge	N/A	不着火不爆炸 No fir no explosion	用 3C 恒流充电, 直到电池的电压达到 4.8V, 然后恒压充电至电流接近 0A。监测测试过程中的电池表面温度, 当电池温度降到比最高温度低 10°C 时结束测试。 Charge with 3C constant current until the voltage of the battery reaches 4.8V, and then charge with constant voltage until the current is close to 0A. Monitor the battery surface temperature during the test, and end the test when the battery temperature drops to 10 ° C lower than the maximum temperature.
强制放电 Forced discharge	N/A	不着火不爆炸 No fir no explosion	电池标准充电后, 以 0.2C 进行放电至 2.0V, 然后以 1C 的电流对电池进行反向充电, 要求充电时间不低于 90min。结束测试, 观察电池外观变化。 After the standard charging of the battery, discharge the battery at 0.2C to 2.0V, and then charge the battery in reverse with 1C current. The charging time shall not be less than 90min. End the test and observe the appearance change of the battery.
外部短路 External short circuit	N/A	电池不爆炸、不起火; 短路过程中电池表面温度 $\leq 150^{\circ}\text{C}$ 。 No fir no explosion Battery surface temperature during short circuit $\leq 150^{\circ}\text{C}$.	电池标准充电后, 将电池接上热电偶后置于通风橱中, 短路其正负极 (导线电阻 $80\text{m}\Omega \pm 20\text{m}\Omega$); 试验中监视电池温度变化, 当电池温度下降到比峰值低 20%, 或短路时间达到 24h, 即可终止测试; 观察电池的温度及外观变化。 After the standard charging of the battery, connect the battery to the thermocouple and place it in the fume hood to short circuit its positive and negative poles (conductor resistance $80\text{m}\Omega \pm 20\text{m}\Omega$); Monitor the change of battery temperature during the test. When the battery temperature drops to 20% lower than the peak value or the short-circuit time reaches 24h, the test can be terminated; Observe the temperature and appearance changes of the battery.
热滥用 Heat abuse	N/A	不着火不爆炸 No fir no explosion	电池标准充电后, 将电池置于热箱中, 温度以 $(5^{\circ}\text{C} \pm 2^{\circ}\text{C}) / \text{min}$ 的速率升至 $130^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 后恒温 30min; 结束测试, 观察电池外观变化。 After the standard charging of the battery, place the battery in the hot box, raise the temperature to $130^{\circ}\text{C} \pm 2^{\circ}\text{C}$ at the rate of $(5^{\circ}\text{C} \pm 2^{\circ}\text{C}) / \text{min}$, and then keep the constant temperature for 30min; End the test and observe the appearance change of the battery.



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自由跌落测试 Free falling(drop)	N/A	开路电压应不低于 90% 的初始电压, 应不泄露, 不起火, 不爆炸。 The open circuit voltage shall not be lower than 90% of the initial voltage, and shall not leak, fire or explode.	电池标准充电后, 搁置 1h~4h 后进行测试, 将电池按 1m 的跌落高度自由跌落于混凝土板上, 圆柱型电池两个端面各跌落一次, 圆柱面跌落两次, 共计进行四次跌落试验, 方型电池每个面各跌落一次, 共进行 6 次, 结束测试。测试完成后电池芯放置 1h, 然后目视检查。 After the standard charging of the battery, it shall be put aside for 1H ~ 4H for testing. The battery shall be freely dropped on the concrete slab according to the drop height of 1m. The two end faces of the cylindrical battery shall be dropped once, and the cylindrical surface shall be dropped twice. A total of four drop tests shall be carried out, and each side of the square battery shall be dropped once, a total of six times. The test is over. After the test, the battery cell shall be placed for 1h, and then visually inspected.
重物冲击 Heavy impact	N/A	不着火不爆炸 No fir no explosion	电池标准充电后, 将电池放置于冲击台上, 将直径为 15.8mm±0.2mm 的金属棒横置在电池几何中心上表面, 采用重量为 9.1kg±0.1kg 的重锤自 610mm±25mm 的高度自由落下, 冲击已固定在夹具中的电池 (电池面积最大的面应与台面垂直), 测试完毕观察 6h。 After the standard charging of the battery, place the battery on the impact table, place the metal rod with a diameter of 15.8mm ± 0.2mm horizontally on the upper surface of the geometric center of the battery, fall freely from the height of 610mm ± 25mm with a weight of 9.1kg ± 0.1kg, impact the battery fixed in the fixture (the surface with the largest cell area shall be perpendicular to the table), and observe for 6h after the test.
挤压测试 Extrusion test	N/A	不着火不爆炸 No fir no explosion	电池标准充电后, 将电池放置在挤压设备的两个挤压平面之间, 从最初接触点开始, 以约 1.5cm/s 的速度持续进行挤压, 逐渐增加压力至 13KN (17Mpa), 一旦获得最大压力就停止测试。圆柱形或方形电池在接受挤压时, 其纵轴要平行于挤压平面, 垂直于挤压方向。方形电池最大面垂直于挤压方向。 After the standard charging of the battery, place the battery between the two extrusion planes of the extrusion equipment, continue the extrusion at the speed of about 1.5cm/s from the initial contact point, gradually increase the pressure to 13kn (17Mpa), and stop the test once the maximum pressure is obtained. When the cylindrical or square battery is extruded, its longitudinal axis shall be parallel to the extrusion plane and perpendicular to the extrusion direction. The maximum surface of the square battery is perpendicular to the extrusion direction.

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6、环境适应性能 Environmental adaptability

测试项目 Test	测试方法 Test method	标准 Standard
振动环境 vibration environment	<p>电芯按标准充电结束后, 将电芯用夹具安装在振动台的台面上, 按下面的振动频率和对应的振幅调整好实验设备。X、Y、Z 三个方向每个方向上从 10~55Hz 循环扫频振动 30min, 扫频速率为 1oct/min: 振动频率: 10Hz~30Hz 位移幅值(单振幅): 0.38mm; 振动频率: 30Hz~55Hz 位移幅值(单振幅): 0.19mm。</p> <p>After the electric core is charged according to the standard, install the electric core on the table of the shaking table with a fixture, and adjust the experimental equipment according to the following vibration frequency and corresponding amplitude. 10. In each of the three directions of Y and Z, the frequency sweeping vibration is cycled from 10 ~ 55Hz for 30min, and the frequency sweeping rate is 1oct / min; Vibration frequency: 10Hz ~ 30Hz displacement amplitude (single amplitude): 0.38mm; Vibration frequency: 30Hz ~ 55Hz displacement amplitude (single amplitude): 0.19mm.</p>	<p>开路电压应不低于 90% 的初始电压, 应不泄露, 不泄气、不破裂、不起火, 不爆炸。 The open circuit voltage shall not be lower than 90% of the initial voltage, and shall not leak, deflate, rupture, fire or explode.</p>
温度循环 Temperature cycle	<p>电池芯在标准充电后, 在环境温度 75±2℃ 条件下开路放置 6 小时, 然后-40℃ 条件下开路放置 6 小时, 温度转换时间小于 30 分钟, 温度循环 10 次, 最后室温条件下放置 24h, 观察电池芯外观变化。 After standard charging, the battery cell shall be placed in an open circuit for 6 hours at an ambient temperature of 75 ± 2 °C, and then placed in an open circuit for 6 hours at - 40 °C. The temperature conversion time shall be less than 30 minutes, and the temperature shall be cycled for 10 times. Finally, it shall be placed at room temperature for 24 hours to observe the appearance change of the battery cell.</p>	<p>不起火、不爆炸、不漏液 No fire, explosion and liquid leakage</p>
恒定湿热 Steady damp-heat	<p>电池标准充电后, 置于温度为 40℃±2℃, 相对湿度为 90~95% 的恒温恒湿箱中, 搁置 48h 后, 取出电池搁置 2h。观察电池外观变化。然后以 0.2C 放电至 2.0V, 测量电池最终容量。 After standard charging, the battery shall be placed in a constant temperature and humidity box with a temperature of 40 °C ± 2 °C and a relative humidity of 90 ~ 95%. After it is put aside for 48h, take out the battery and put it aside for 2h. Observe the appearance change of the battery. Then discharge to 2.0V at 0.2C and measure the final capacity of the battery.</p>	<p>电池外观无明显变形、无锈蚀、不泄露、不泄气、不破裂、不起火不爆炸; 放电时间≥3 小时; The appearance of the battery shall be free of obvious deformation, rust corrosion, leakage, frustration, rupture, fire and explosion; Discharge time ≥ 3 hours;</p>

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<p>低气压 Low pressure</p>	<p>电池标准充电后, 将电池搁置在真空箱中, 真空箱密闭后, 逐渐减少起内部压力至不高于 11.6kpa, 并保持 6h, 结束测试。 After the standard charging of the battery, put the battery in the vacuum box. After the vacuum box is sealed, gradually reduce the internal pressure to no more than 11.6kpa and keep it for 6h to end the test.</p>	<p>电池应不泄露、不泄气、不破裂、不起火, 不爆炸。 The battery shall not leak, deflate, break, catch fire or explode.</p>

7、参考标准 Reference standard:

- GB/T18287-2013**
- GB31241-2014**
- UL2054**
- EC62133**
- UN38.3**
- CE61960**

8、注意事项 PRECAUTIONS TO ENSURE THE SAFETY ON BANDING BATTERY

1. 电池在使用前必须充电。
Batteries should be charged prior to use.
2. 在使用新电池前, 或者长期存放后第一次使用电池, 在使用前请将电池充满电。
.When using a new battery for the first time or after long term storage, please fully charge the battery before use.
3. 充电方法请参考我们的技术手册。
For charging methods please referrence to our technical handbook.
4. 不要对电池进行反充电。
Do not reverse charge batteries.
5. 充电时请选用锂离子电池专用充电装置
When charging, please select the special charging device for lithium ion battery
6. 不要将电池短路,那可能永久的损坏电池。
Do not short circuit batteries, permanent damage to batteries may result.
7. 不要燃烧或毁坏电池, 可能导致有毒气体释放或爆炸。
Do not incinerate or mutilate batteries, may burst or release toxic material.
8. 不要让电池处于不利环境中, 比如极端的温度, 深度循环, 或者经常过充/过放电
Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive overcharge/overdischarge.
9. 将电池贮存在阴凉干燥处。
Store batteries in a cool dry place.
10. 不要将 VB power 电池与其他品牌的电池或者不同种类的电池, 比如碱性锌电池混用。
Do not mix VB power batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon.
11. 不要将新旧电池混用, 可能会导致过放电。

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Do not mix new batteries in use with semi-used batteries, overdischarge may occur.

12. 当把电池放入充电器中时，注意保证极性正确。

When connecting a battery pack to a charger, ensure correct polarity.

13. 如果出现噪音，温度异常，或者漏液，请停止使用。

If find any noise, excessive temperature or leakage from a battery, please stop its use.

14. 如果电池发烫，请勿触摸，直至冷却。

When the battery is hot, please do not touch it and handle it, until it has cooled down.

15. 不要把电池（电池组）的外套去除。

Do not remove the outer sleeve from a battery pack nor cut into its housing.

16. 电池使用时发现功率下降，请关闭用电器开关以防止电池过放。

When find battery power down during use, please switch off the device to avoid overdischarge.

17. 当电池不使用时，请把它从装置上取下。

When not using a battery, disconnect it from the device.

18. 取下电池组时，用手抓住插头而不是拉线。

Unplug a battery by holding the connector itself and not by pulling at its cord.

19. 电池使用后，如果电池发热，再次充电前，请在通风环境中冷却。

After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

20. 不要将电池放入水中或海水中。

Never put a battery into water or seawater.

21. 经过长时间存放，电池应每三个月进行一次充放电。

During long term storage, battery should be charged and discharged once every half a year.

22. 不要尝试分离，挤压，撞击电池，电池会发热或起火。电池中的碱液对皮肤和眼睛有害，而且会损伤衣服。

Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.

25. 要使电池远离儿童。如发现吞食，立即联系医生。

Keep away from children. If swallowed, contact a physician at once.

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9、电路保护参数 Electric Protect Features

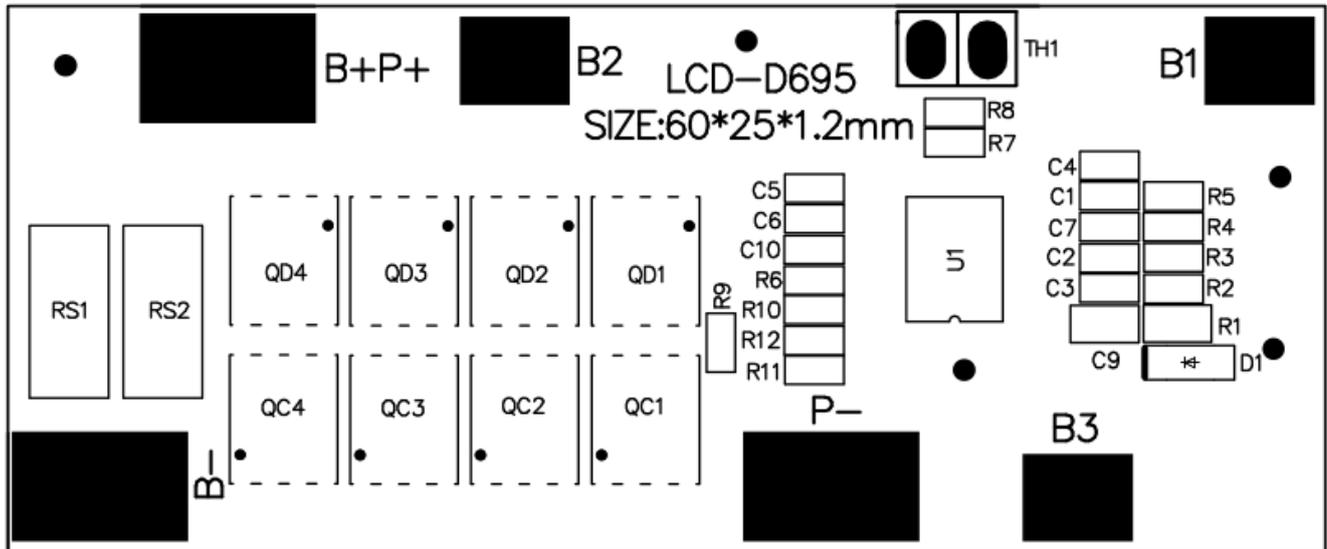
Item 项目	Content 内容	Criterion 标准
Over charge Protection 过充保护	Over charge detection voltage 过充保护电压	4.25±0.05V
	Over charge detection delay time 过充保护延迟时间 过充保护延时	500~1500ms
	Over charge release voltage 过充恢复电压	4.15±0.05V
Over discharge protection 过放保护	Over discharge detection voltage 过放保护电压	2.7±0.1V
	Over discharge detection delay time 过放保护延迟时间	500~1500ms
	Over discharge release voltage 过放恢复电压	3.0±0.1V
Charging current 充电电流	Maximum continuous charging current 最大持续充电电流	10A
Discharging current 放电电流	Maximum continuous discharging current 最大持续放电电流	20A
Over current protection 过流保护	Over current detection current 过流保护电流	45~55A
	Detection delay time 延迟时间	500~1500ms
	Release condition 恢复条件	Cut load
Short protection 短路保护	Detection condition 检测条件	Exterior short circuit
	Detection delay time 短路延时	100~800µs
	Release condition 恢复条件	Cut short circuit
Interior resistance 内阻	Main loop electrify resistance 回路内阻	R _{DS} ≤15mΩ
Temperature protection 温度保护	Charging high temperature 75 °C, discharging high temperature 75 °C 充电高温 75 度 放电高温 75 度	
Self consumption 自耗		100uA

Function description: This protection board is equipped with total voltage low-voltage protection. When the total voltage of the cell is 12.4+/-0.5v, the battery discharge is cut off

功能描述: 本保护板带总电压低压保护, 当电芯总电压 12.4+/-0.5V 时, 切断电池放电。

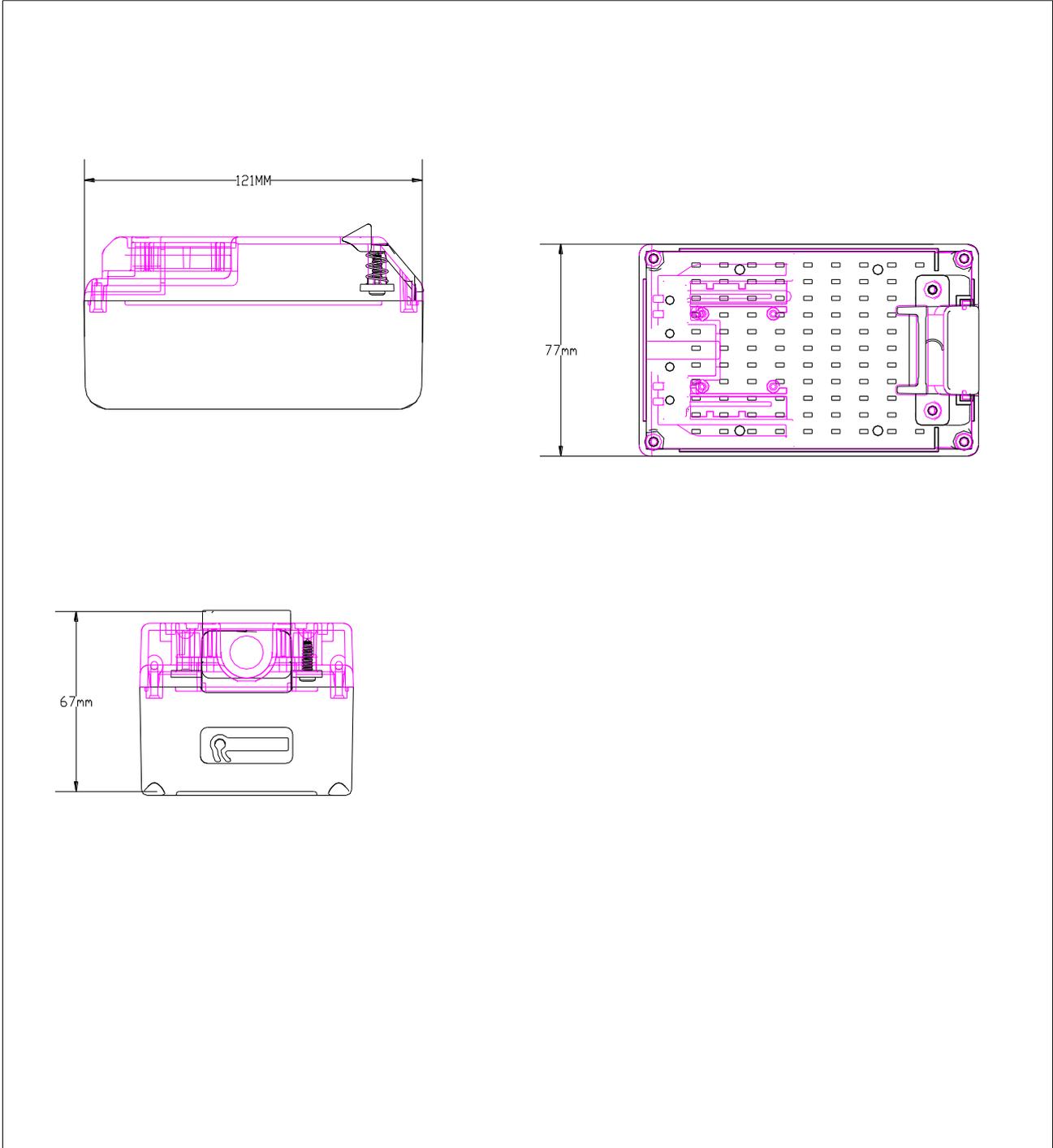
	东莞伟博电池科技有限公司 Dongguan Victory Battery Technology Co., Ltd	REV: A
	地址: 广东省东莞市黄江镇田心村蝴蝶 2 路伟博科技园 TEL: 86 (0) 769-8260 5822 FAX: 86 (0) 769-8260 5811	DATE:24.05.18

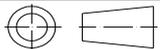
10、保护板 TOP&BOTT (BMS TOP&BOTT)



	东莞伟博电池科技有限公司 Dongguan Victory Battery Technology Co., Ltd	REV: A
	地址: 广东省东莞市黄江镇田心村蝴蝶2路伟博科技园 TEL: 86 (0) 769-8260 5822 FAX: 86 (0) 769-8260 5811	DATE:24.05.18

11、Battery Outline Drawing 电池外形尺寸图

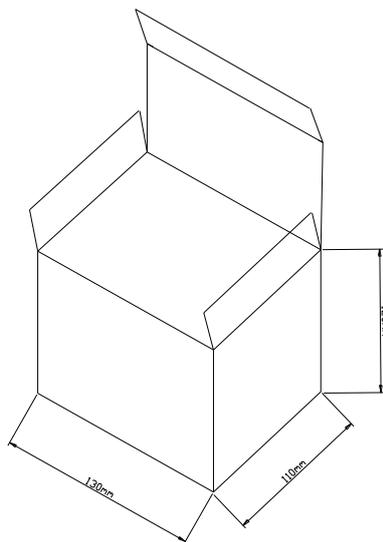


版本	A/01	比例	1:1	电池组合图	产品名称	VB-18650-4S3P-14.4V-10.5Ah	
制图	刘曦	时间	2022-05-31	 东莞市伟博电池科技有限公司 Dongguan Victory Battery Technology CO., Ltd.	等级	WI	
审核	陈操	时间	2022-05-31		单位	mm	
批准	康英各	时间	2022-05-31		第三视觉		

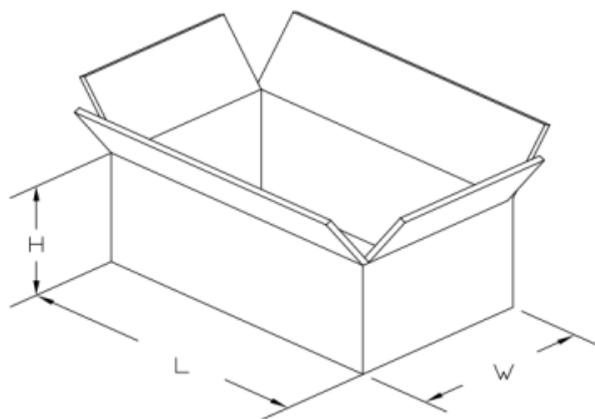
	东莞伟博电池科技有限公司 Dongguan Victory Battery Technology Co., Ltd	REV: A
	地址: 广东省东莞市黄江镇田心村蝴蝶2路伟博科技园 TEL: 86 (0) 769-8260 5822 FAX: 86 (0) 769-8260 5811	DATE:24.05.18

12、装箱方式(Packing way)

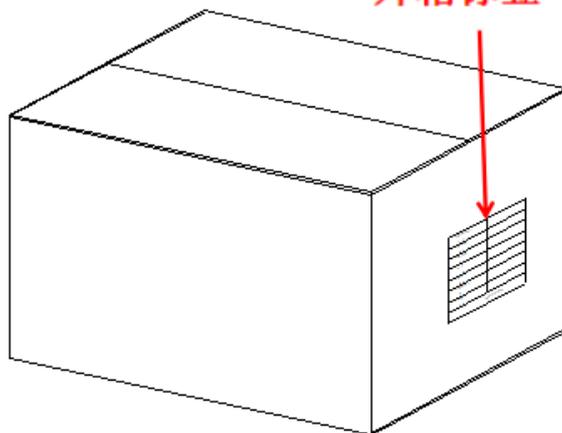
12.1、主体盒 (Individual box) : (1PCS/box)



12.2、主体箱 (Carton box) : (4PCS/box)



Carton label
外箱标签



	Length 长	Width 宽	Height 高
Size (cm) 尺寸	48.5	15.0	15.2
Tolerance (cm) 公差	±1	±1	±1
QTY (pcs) 数量	4		4
G. W. (Kg) 毛重	4.0 (不含电话线 Without sprial cable)		4.6 (含电话线 with sprial cable)