广东力科新能源有限公司

Guangdong Pow-Tech New Power Co.,Ltd.

Technical Data Sheet

产品规格书

CONFIDENTIAL

Customer:

Model Name: PT18650-4P PCM13000

Battery P/N:

Client P/N: T8160

Description: Rechargeable Lithium-ion Battery Pack

Principal/制定	Checked/审核	Approval/批准
袁春华	晋文章	王友伟
Customer Approval 客户回签		

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ADD:Room903, Tower A,ZhuoyueMeilin central square (South district) ,Zhongkang Road, Shangmeilin area, Futian District, Shenzhen.
工厂: 东莞市寮步镇横坑石岭工业区横东三路 9 号。
Factory:No.9,Hengdong 3 Road,HengkengShiling industry Zone,liaobu Town, Dongguan.

Revision History
修订履历

No.	Revision/版	Date/日期	Revision Content/修订内容	Principal/制定
1	A0	2021-10-28	First issue	袁春华
2	A1	2021-11-08	外露线长从 23 改为 40mm	袁春华
3	A2	2021-11-19	0.3mm 厚泡棉改为 0.8mm	袁春华
4	A3	2021-11-26	更新原理图	袁春华
5	A4	2022-02-11	更新成品图，标贴贴在泡棉上	袁春华

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目录

1. Application 适用范围

The specification is applicable to Guangdong Pow-Tech New Power Co., Ltd. with basic performance, technical requirement, testing method, warning and caution of the rechargeable Lithium-ion battery.

本规格书规定了可充电锂离子电池的基本性能、技术要求、测试方法及注意事项，本标准只适用于广东力科新能源有限公司。

2. Battery Pack Overview 电池组概述

2.1 Pack Main Characteristics 主要特性

Cell Model 电芯型号	Pack Configuration 电池组配置	Nominal Voltage 标称电压	Nominal Capacity（Typical） 标称容量（典型）
SW18650-34MP 3350mAh	1S4P	3.6V	13000mAh

2.2 Connector Terminal Specifications 输出端子规格 1.25T-1-6P

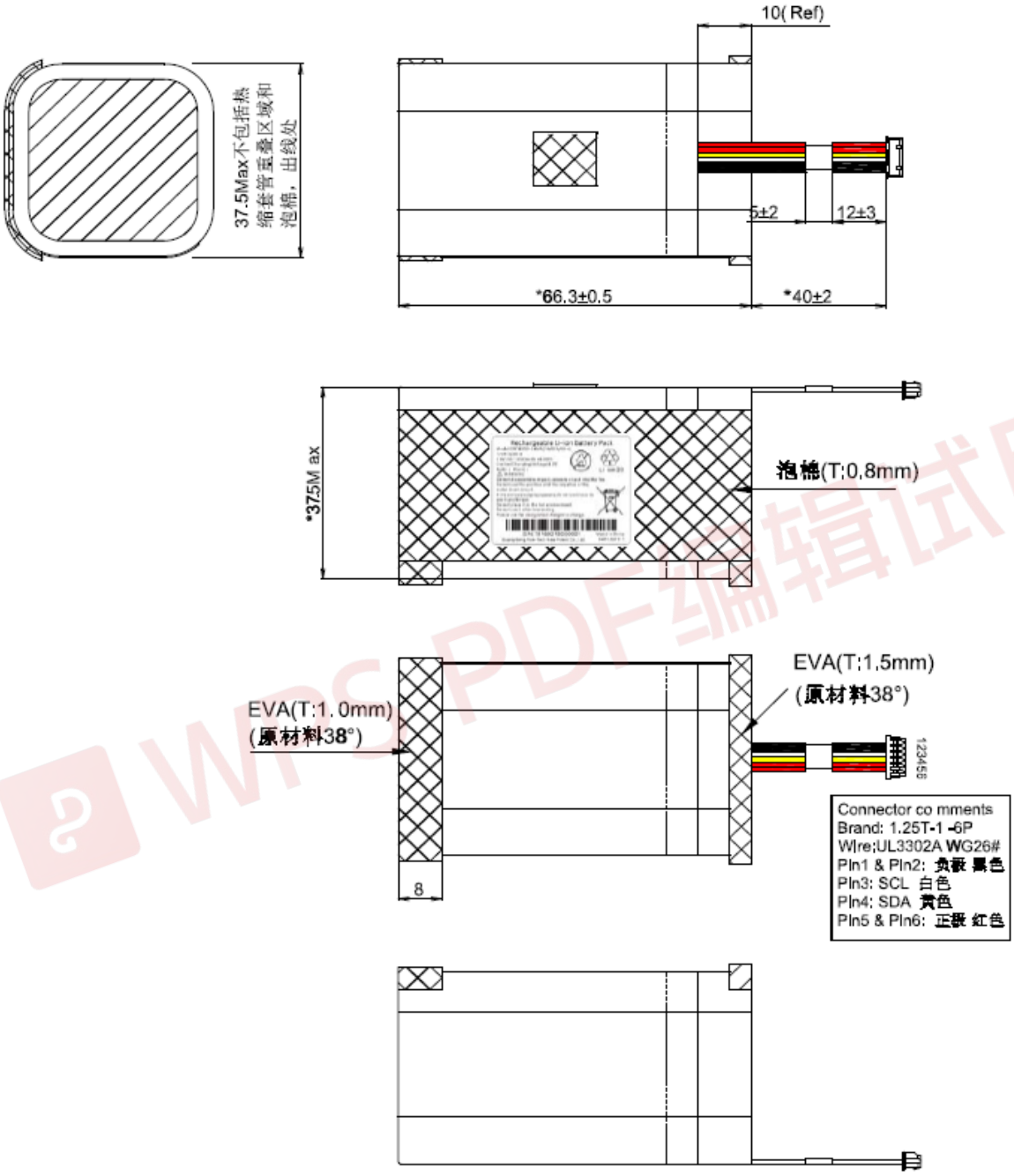
Terminal 端子	Name 定义	Description 描述
PIN1/2	P-	Battery Negative Terminal/电池输出负极，黑色
PIN3	SCL	通讯口 SCL，白色
PIN4	SDA	通讯口 SDA，黄色
PIN5/6	P+	Battery Positive Terminal/电池输出正极,红色

Battery pack output port diagram/电池组输出端口图

Connector comments
Brand: 1.25T-1-6P
Wire:UL3302AWG26#
Pin1 & Pin2: 负极 黑色
Pin3: SCL 白色
Pin4: SDA 黄色
Pin5 & Pin6: 正极 红色

3. Battery pack outline dimensions 电池组外形尺寸

成品尺寸图 battery dimensions



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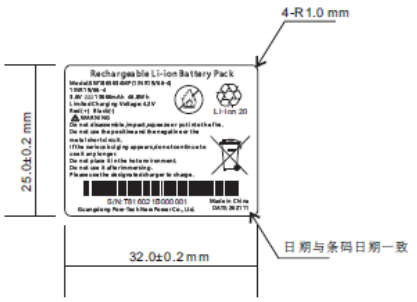
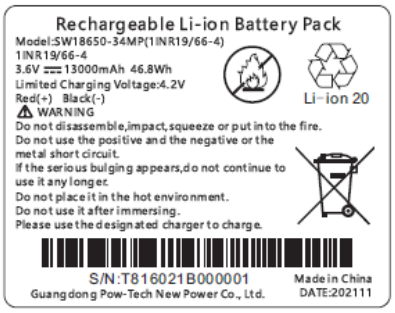


放大图



编码规则
编码方式：Code 128
扫码内容：T816021B000001，扫码位数14位
包含一切横杠和字符
1、T8160(5位)固定代码；
2、21(2位)代表年份，年取最后二位数，2021年代码“21”，以此类推，按订单要求；
3、B(1位)代表11月份，A代表10月份，1代表1月份，以此类推，按订单要求；
4、000001(6位)代表流水号，采用十进制，从000001开始，到999999结束，每月归零。

4. Battery pack Specifications 电池组规格

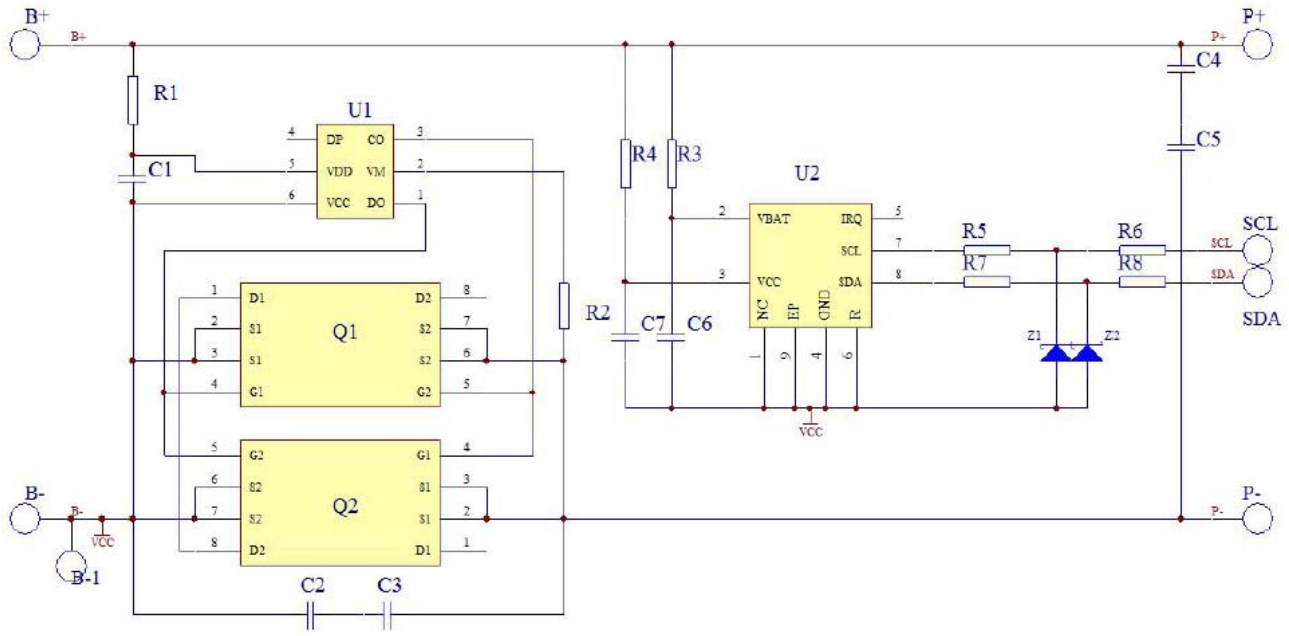
No	Item 项目		Specifications 规格	Remark 备注
4.1	Capacity 容量	Nominal Capacity (Typical) 标称容量（典型）	13000mAh	From FC voltage to 2.8V by discharge current 0.2C at 25℃ ± 3℃.
		Minimum Capacity 最小容量(Cmin)	12300mAh	From FC voltage to 2.8V by discharge current 0.2C at 25℃ ± 3℃.
4.2	Nominal voltage 标称电压		3.6V	
4.3	Charge 充电	Charging Method 充电模式	CC-CV	
		Full Charging(FC)Voltage 最高充电电压	4.2V	Upper limited charge voltage
		Standard Charging Current 标准充电电流	0.2C(2600mA)	
		Max Charging Current Continuously 最大持续充电电流	3000mA	

		Standard Charging method 标准充电模式	0.2 C CC charge to 4.2V,then CV charge till charge current decline to 0.02 C 以 0.2 C 恒流充电至电压 4.20V，然后以 4.20V 恒压充电至充电电流 0.02 C	
4.4	Discharge 放电	Standard Discharging Current 标准放电电流	0.2C	
		Max Discharging Current Continuously 最大持续放电电流	3000mA	
		Standard Discharging method 标准放电模式	With the discharge current 0.2 C to 2.8V cut-off voltage After standard charge 标准充电后恒流 0.2 C 放电至 2.8V	
4.5	Operation Temperature 工作温度		Charge 充电：0 to 45℃	
			Discharge 放电：-20 to 60℃	
4.6	Battery Pack Approx. Weight (g) 电池参考重量		About:190g	
4.7	Storage Temperature 储存温度	1 year 一年	-20~20℃	If the battery pack (shipping status) store at over the 3 months period, it should be recharged. Humidity: 60±20%
		3 month 三个月	-20~45℃	
		1 month 一个月	-20~50℃	
4.8	AC Impedance 交流内阻		≤90mΩ	1KHz AC Method
4.9	As of shipment (status of the delivery) 出货状态 (Pack Voltage 电池组电压)		3.55V-3.75V	The voltage range is valid for 20 days after delivery. 电压范围有效期为出厂 20 天内.
4.10	Operation mode consumption current/正常模式下功耗		<30uA	
4.11	Cycle Life 循环寿命		>80% after300 cycles	See 9.2 Electrical Performance For Detail
4.12	ESD static test/静电测试		Air discharge	±8KV
			Contact discharge	±4KV

5. PCBA Protect Function 保护功能

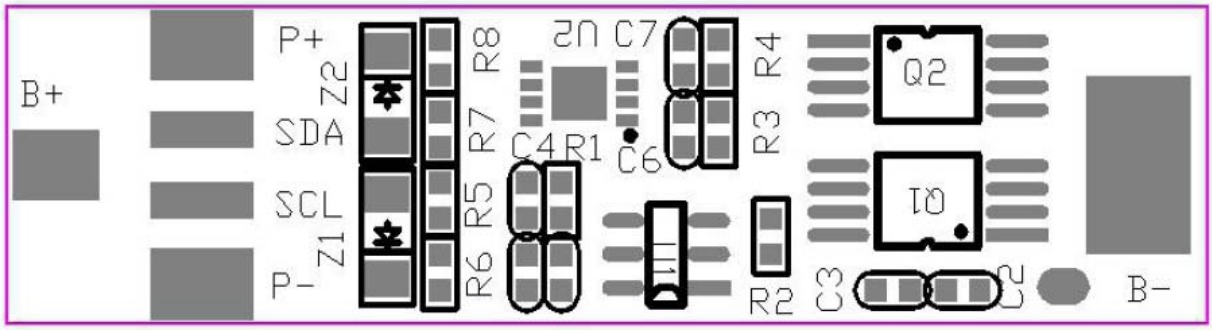
NO	Items/目录	Criteria/标准
5.1	Over-charge Protection Voltage/过充保护电压.	4.25±0.025V
5.2	Over-Charge Protection Delay Time/过充保护延迟时间	700~1300ms
5.3	Over-charge release Voltage/过充保护恢复电压	4.05±0.05V
5.4	Over-discharge Protection Voltage/过放保护电压.	2.800±0.07V
5.5	Over-Discharge Protection Delay Time/过放保护延迟时间	16±5ms
5.6	Over-Discharge protection release voltage/过放保护恢复电压	3.000±0.075V
5.7	Discharge Over-current Protection/ 放电过流保护.	3.6~8.8A
5.8	Discharge Over-Current Protection Delay Time/ 放电过流保护延迟时间	12±4ms
5.9	Short-Circuit Protection Delay Time /短路保护延迟时间	230~500us
5.10	Current Consumption(operation) /工作时静态电流	30uA(max)
5.11	Current Consumption(standby)/保护状态下静态电流	5.0uA(max.)
5.12	Resistance Impedance /导通内阻	≤50mΩ
5.13	0V Battery Charge function/ 0V 电池充电功能	有
5.14	Communication port/通讯端口	I2C

6. Schematic 电路原理图



7. PCB Layout PCB 板图

Top overlay



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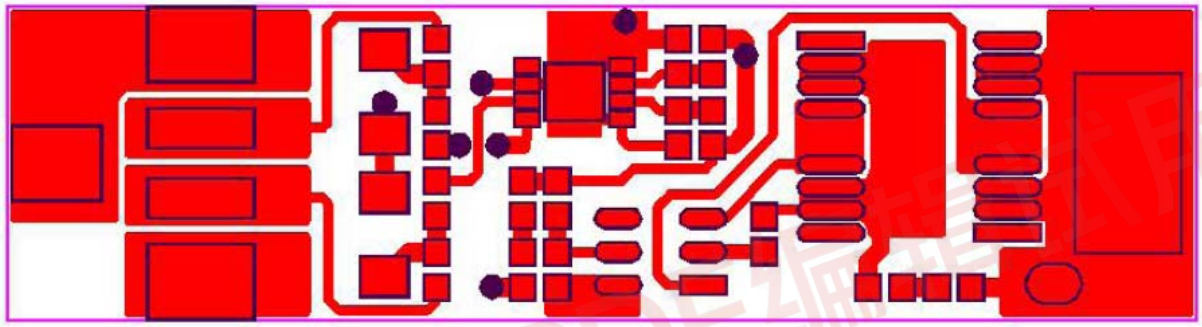

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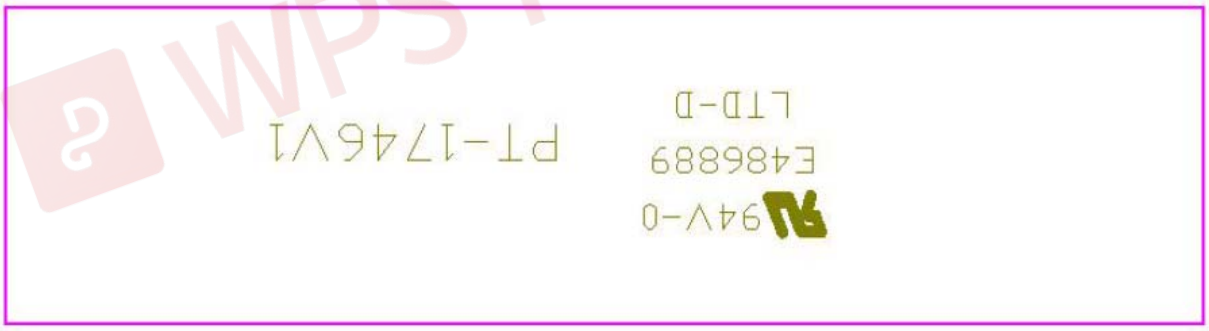

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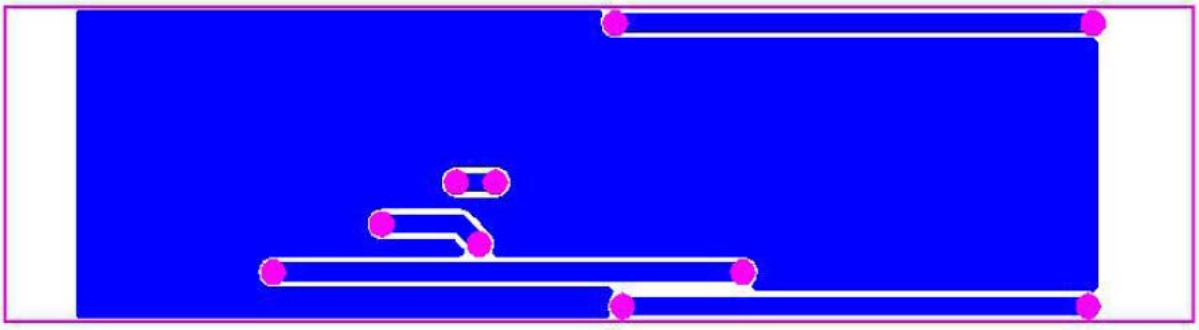

8. Key Electronic Components 关键元器件

Item	Symbol	Description	Part	Manufacturer	Qty

8.1	U1	Protect IC	R5478N218CD ROHS SOT-23-6	理光	1
8.2	Q1,Q2	Power MOSFET	DP8205A TSSOP-8	德普微	2
8.3	U2	IC	AXP2601 全志 ROHS DFN8	全志	1
8.4	PCB		2 层无铅喷锡 喷锡 白字绿油 ROHS 尺寸 35±0.15*9±0.1*0.8±0.1 FR-4 1OZ FR4 V-0		1

9. Battery Electronic Characteristics 电性能特性

Standard environmental test condition. Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition:
Temperature : 25℃ ± 3℃, Humidity: 60 ± 20%
标准环境试验条件。除非另有规定，否则本产品规范中规定的所有试验均在以下条件下进行：温度：25℃ ± 3℃；湿度：60 ± 20%。

No.	Item/项目	Test Method and Condition/测试方法和条件	Criteria/标准
9.1	Rated Capacity 额定容量	Constant current 0.2C charge to FC Voltage, then constant voltage FC Voltage charge to current declines to 0.02C, rest for 10min, constant current 0.2C discharge to 2.8V. 以 0.2C 恒流充电到 FC 电压，然后以 FC 恒压充电至截止电流为 0.02C，静置 10 分钟，然后以 0.2 C 恒流放电到 2.8V。	Id=0.2CCapacity≥12 300mAh
9.2	Cycle Life 循环寿命	Constant current 0.2C charge to FC Voltage, then constant voltage FC Voltage charge to current declines to 0.02C, rest for 10min, constant current 0.2C discharge to 2.8V, rest for 10min. Repeat above steps till continuously discharge capacity higher than 80% of the initial capacity of the battery. 电池以 0.2C 充饱，静置 10 分钟，然后以 0.2C 放空，静置 10 分钟。重复以上充放电循环直至放电容量低于初始容量的 80%。	Cycle times: ≥300 times. Capacity≥ 80%. 循环次数：300 次. 容量保持率≥ 80%.
9.3	Storage Characteristic 荷电保持率	When the battery has completed standard charged, it shall be disconnected and put aside for 28 Days at 25℃±3℃, Then measured the capacity with 0.2 C till FD Voltage. 将充满电后的电池在温度 25±3℃环境下存储 28 天，按照标准的测试容量方法测试剩余容量。	Retention capacity > 85% 容量保持率> 85%
9.4	Initial Impedance	Using a AC 1KHZ meter whose precision must be less than 0.5%, detect the resistance between the battery’s positive and negative terminals. The result value can not include any external	The internal resistance≤90mΩ 电池内阻值小于或等于 90mΩ。

		conductor’s resistance. The maximum and the minimum need to be recorded. 使用AC 1KHz 检测方法及准确度不低于0.5 级的仪表，测量电池接口处正负极之间的内阻值，若检测仪表在检测过程中使用附加的电池固定夹具和引线，可以视情况减去固定引线的电阻值，且记录最大与最小之差值。	
9.5	ESD Test	Method: 5 times/pin , Frequency:1min/time Non-operating: Contact: ± 4KV ;Air: ± 8 KV 对电池组每个端子或者电路板的输出端子进行±4KV 接触放电测试各 5 次和±8KV 空气放电测试各 5 次，每两次放电测试时间间隔 1 分钟.	No explosion and no fire. Its protection function shall not fail. if it is equipped with protection circuit. 电池组应不起火、不爆炸，如有保护电路其保护功能不应失效。

10. Reliability Test 可靠性测试

No.	Item/项目	Test Method and Condition/测试方法和条件	Criteria/标准
10.1	Over-Voltage Charge Test 过压充电测试	After standard charging, the battery is conducted for 8 hours while the constant voltage is held at 4.6V/cell and standard charging current flows through it. 将标准充电后的电芯，用恒定电压 4.6V/串和标准充电电流给电池进行加压 8h.	No explosion, No fire 无爆炸、无起火
10.2	Short-circuit Test 外部短路测试	Rest battery for 30min at 20 ± 5℃ after standard charged. Connect between battery terminals with copper lead (electric resistance: 80 mΩ±20mΩ) and leave for 12hour. 将电池组充满电后，短路电池组的正负极端子，外部短路总电阻为 80 mΩ±20mΩ。保持电池组短路 12h.	No explosion, No fire. Max. Temp of Battery surface should not exceed 150℃。 无爆炸、无起火，电池组表面温度不超过 150℃.
10.3	Heating Test 热冲击	The battery is placed in a thermal chamber. Temperature is raised to 130±2°C at the rate of (5±2°C)/min and held for 30 minutes, then cooled to room temperature at the rate of 5±2°C/min. 电池置于热箱中，温度以（5±2℃）/min 的速率升至 130±2℃并保温 30min,再以 5±2℃/min 的速度降至室温.	No explosion, No fire. 无爆炸、无起火。
10.4	Temperature cycling Test 温度循环测试	The batteries are to be placed in a test chamber and subjected to the following cycles: A: Raising the chamber temperature to 70±3℃ within 30 minutes and maintaining this temperature for 4 hours. B: Reducing the chamber temperature to 20±3℃	No explosion, No fire 无爆炸、无起火。

		within 30 minutes and maintaining this temperature for 2 hours. C:Reducing the chamber temperature to minus40 ±3℃ within 30 minutes and maintaining this temperature for 4 hours. D: Raising the chamber temperature to 20±3℃ within 30 minutes and maintaining this temperature for 2 hours. E: Repeating the sequence for a further 10 cycles. 电池应放置在测试温柜中，并进行下列循环: A: 30 分钟内将温柜温度提高到 70±3℃，维持 4 小时。 B: 30 分钟内将温柜温度降至 20±3℃，维持 2 小时。 C: 30 分钟内将温柜温度降至-40±3℃，维持 4 小时。 D: 30 分钟内将温柜温度提高到 20±3℃，维持 2 小时。 E: 重复这个测试 10 个周期。	
10.5	Vibration Test 振动测试	After standard charging, the battery is secured to a vibration table and subjected to vibration cycling in which the frequency is varied at the rate of 1Hz per minute between 10Hz and 55Hz; the excursion of the vibration is 0.8mm. The battery shall be vibrated for 100 minutes on each of X, Y, and Z axis。 将标准充电后的电池固定在振动台上，并沿 X、Y、Z 三个方向各振动 100 分钟，振幅为 0.8mm ，振动频率为 10Hz－55Hz，每分钟变化 1Hz。	No explosion, No fire. 无爆炸、无起火。
		Remark: The test is not suitable for battery pack with no housing. 备注：本试验不适用于无壳电池组。	
10.6	Drop Test 跌落测试	After full charged, the battery is dropped from a height of 1 meter onto a concrete surface. Including end of cell fall down once each, round the cylinder falls twice. 电池组是满电状态，然后从1米的高度跌落3次到混泥土板上。正负极端子向下各跌落一次，圆柱面方向跌落两次。	No explosion, No fire 无爆炸、无起火。
		Remark: The test is not suitable for battery pack with no housing. 备注：本试验不适用于无壳电池组。	

11. Packaging 包装

The sketch, sizes, color of marking should match GB/T191-2016 requests.
标志的图形、尺寸、颜色应符合 GB/T 191－2016 的要求.
The manner of packing should match 2019 IATA DGR 60th Edition requests.
包装方式符合 2019 IATA DGR 60 的要求。

12. Handling Precautions and Guideline 操作及注意事项

12.1 Charge 充电

Charge current: Never out of the max charge current as mentioned in specification.

充电电流：不能超过规格书规定的最大的充电电流。
Charge voltage：Never out of the max charge voltage as mentioned in specification.
充电电压：不能超过规格书规定的最高的限制电压。
Charge temperature： Please refer to the temperature range as specification.
充电温度：电池充电温度必须按照规格书的温度范围执行。
Charge as constant current before constant voltage, Never reverse the charge mode.
先恒流后恒压方式充电，禁止颠倒的方式充电。如果电池正负极颠倒充电会带来危险。

12.2 Discharge current 放电电流

The discharge current is not allowed to out of max current as specification. Otherwise, the battery will be over heat and capacity fading.
电池放电电流不能超过规格书规定的最大放电电流，过大的电流放电会造成电池发热和容量衰减。

12.3 Discharge temperature 放电温度

Please refer to the temperature range as specification.
电池放电温度必须按照规格书的温度范围执行。

12.4 Over-discharge 过放电

It's workable if over charge and discharge for a short while but not allow to do it for a long time. Over discharge may result in disappear self-energy. Please keep a certain electric quantity to prevent over discharge.

短时间的过充过放不影响电池的使用，但是长时间的过放电会影响到电池的功能失效，电池永久性不能适用，电池可能过放还有一个原因是自动能量的消失。预防电池过放的出现方法是电池应保持一定的电量。

12.5Storing the Batteries 贮存电池

Please store the battery in the adequate temperature as mentioned in specification. When battery is delivered, if the capacity is about 60%.Suggest to recharge it after more than 6 months. When battery is charged full, Suggest to recharge it after more than 9 mouths.

电池贮存在规格书规定的温度范围内。如果电池出货时带电量在 60%左右，建议贮存超过六个月时，给电池充电；电池充满电后贮存时，建议贮存超过九个月时，给电池充电。

12.6Storage 贮存

- Store the battery in cool, dry and well-ventilated conditions.
  电池贮藏在通风干燥的环境中。
- Regulations vary for different countries. Dispose of in accordance with local regulations.
  不同国家法规的不同，处理时根据当地的法规。

12.7Other Chemical Reaction其它化学反应

The battery performance will reduce if over time using or unused for a long time due to It's a reaction of chemical. In addition, the battery life will be shorten or injury or damage itself from electrolyte leakage, heating ignition or explosion for improper handling. It's necessary to replace battery if unable to charge for a long time even with proper way.
由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使是存放很长一段时间而不使用。如果使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，也会缩短电池的使用寿命，或者产生漏液导致电池损坏。如果电池长周期不能充电，即使充电方法正确，这样需要更换电池。

13. Warnings 使用警告

Please read the manual carefully before using it to ensure properly use.
为了使电池安全的使用及处理请在使用前认真的阅读操作说明.

- Do not make the battery exposure or thrown into fire.
  不能把电池曝晒或丢在火中.
- Never reverse charge the battery.
  电池充电时不能把正负极性装反.
- Never short circuit the battery.
  避免短路电池.
- Avoid excessive physical shock or vibration.
  避免过分的物理震动和冲击电池.
- Do not disassemble or deform the battery.
  不能拆解或使电池变形.
- Never allow the battery to get wet or be immersed in water.
  不能将电池浸入水中.
- Do not use different types of battery together.
  不能将其它不同厂家、类型、型号的电池混合使用.
- Keep away from children.
  禁止小孩接触电池.
- Charge at the appropriate conditions.
  电池必须在合适的条件下充电.
- Never use the faulty charger to charging.
  决不能用故障的充电器给电池充电.
- Never keep charging more than 24 hours.
  电池持续充电不能超过 24H.

14. Warranty period 保质期

Guarantee period of quality is one year from the date of shipment. Pow-Tech guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer's abuse.

电池的保质期从出货之日算起为一年。如果证明电池的缺陷是在 Pow-Tech 公司制造过程中造成的而不是客户错误使用造成，本公司负责退换电池。

15. Remarks 备注

15.1 What has been mentioned above can be regarded as the conventional framework between the supplying and requisitioning parties in respect to the product performance and examination rule of the battery.

上述内容可以作为供需双方对于电池产品性能和检验规则的约定框架.

15.2 Use of the information described herein for other purposes and/or reproduction or copying without the express permission of POW-TECH is strictly prohibited.

本资料内容未经本公司许可，严禁以其他目的加以转载或复制等。

15.3 No responsibility is assumed by us for any consequence resulting from any wrong or improper use of operation, etc. of the product.

如因误操作或者不正当使用等造成的相关后果，我司不负任何责任。

15.4 Any other items which are not covered in this specification shall be agreed by both parties.
本规格书未包括事项应由双方协议确定。

外发文件
外发编号：CRK-W-20220531-003

受控文件

产品技术规格书

TECHNICAL DATA SHEET

锂/二氧化锰电池

Lithium Manganese Dioxide Cell

型号：CR1225

Model: CR1225

批准 Approved	审核 Checked	编制 Draft

客户回签 Customer signature
公司名称： Company name: 批准人： Approved by: 签（章）日期： Signature date：

制定日期 2022.05.27

Established date:May,27.2022

惠州亿纬锂能股份有限公司

EVE Energy Co., Ltd.

修订记录

Edit Record

版本 Edition	修订者 Editor	修改页码 Edit page	制定日期 Established Date	修订原因 Edit Cause
A	罗科爽 Luo Keshuang	所有 All	2022.05.27	首次发行 First edition

1. 适用范围 Scope

The document applies to CR1225(Li/MnO_2) battery supplied by EVE Energy Co., Ltd. Specify quality, test method, performance, quality assurance and matters need attention etc..

该产品规格书适用于惠州亿纬锂能股份有限公司（简称 EVE）出品的 CR1225（锂-二氧化锰）扣式电池，规定产品的性能指标、测试方法、品质控制，以及使用注意事项等。

2. 标称规格 Nominal specification

2-1 机型（电芯） Model	CR1225
2-2 标称电压 Nominal Voltage	3.0 V
2-3 标称容量 Normal Capacity	50mAh （在 20±3℃环境下 62KΩ 放电至 2.0V） 50mAh (62KΩ to cut-off voltage 2.0V at 20±3℃)
2-4 最大持续放电电流 Maximum Continuous Discharge Current	0.5mA
2-5 尺寸 Dimensions	见附图 See the attaching drawing
2-6 重量 Approx. Weight	1.0g
2-7 外观 Appearance	无明显变形、标志清晰。 There shall be no obvious deformation, and the mark shall be clear.
2-8 温度 Temperature	工作：-20~70℃ （注意：如果持续使用温度超出-10℃~+60℃，请联系 EVE） Operating: -20~70℃ (Note: Consult EVE when using batteries at temperatures exceeding the -10℃ to +60℃ range)
2-9 建议贮存条件 Recommendable Storage Condition	温度：5℃~35℃ 湿度：小于 70%RH Temperature: 5℃~35℃ Humidity: Less than 70%RH

2-10 电池组成 Battery Composition	锂原电池是由二氧化锰正极、锂金属负极、有机电解液及锂盐组成。 Lithium primary battery composed of cathode from manganese dioxide, anode from lithium, and electrolyte from organic solvent and lithium salt.

3. 电池特性 Battery characteristics

序号 NO.	项目 Item	测试方法 Test method	测试温度 Test temperature	初始值 Initial Value
3-1	开路电压 Open circuit voltage	两极端之间的电压（最小值） Voltage between two terminals (min.)	20℃±3℃	3.05V
3-2	内阻 Internal resistance	1 kHz 正弦波的方法（最大值） 1 kHz sine wave method (max.)	20℃±3℃	100Ω
3-3	负载电压 Load voltage	62kΩ测试 2s（最小值） 62kΩ, during 2s(Min.)	20℃±3℃	2.7V
3-4	标称容量 Nominal capacity	62kΩ持续放电至 2.0V 62kΩ Continuous discharge to 2.0V	20℃±3℃	850h
	快速放电 Fast discharge duration	3kΩ持续放电至 2.0V 3kΩ Continuous discharge to 2.0V		28h

4. 测试 Test

4.1 测试条件 Test condition

常规测试条件如下（除非另有规定）：

温度: 20±3℃，相对湿度：65±10%,气压: 1.0atm.

The test normal condition is as follow (unless otherwise specified)

Temperature: 20±3℃, Relative Humidity：65±10%, Pressure: 1.0atm.

4.2 测试设备 Test Instrument

4.2.1 尺寸测试：卡尺，精度为 0.02mm，或者具有相同精度的其他量具。

Dimension measurement: Caliper with accuracy of 0.02mm, or other gauges with the same

accuracy.

4.2.2 电压表公差为±0.01V，阻抗大于或等于 10MΩ

Voltmeter: The tolerance shall be ±0.01V and the input resistance rating shall be 10MΩ or more.

4.2.3 精密电阻：精度为±0.5%

Exactitude resistance: accuracy of ±0.5%.

4.2.4 电阻计：精度为±0.5%

Resistance meter: accuracy of ±0.5%.

4.2.5 恒温箱：精度为±2℃

Constant temperature oven: accuracy of ±2℃.

4.2.6 电子称：公差为±0.01g

Electronic scale: tolerance shall be ±0.01g.

4.3 初始值测试 Initial test

电池应在交付后 1 个月内进行测试。

Batteries should be tested in the first 1 month after delivery.

4.3.1 外部尺寸 Outside dimensions

使用 4.2 规定的量具进行测试。测试结果应符合 2-5 要求。

The gauge as specified in 4.2 is used. The result should meet the requirement of 2-5.

4.3.2 重量 Weight

使用 4.2 规定的量具进行测试。测试结果应符合 2-6 要求。

The gauge as specified in 4.2 is used. The result should meet the requirement of 2-6.

4.3.3 开路电压 Open circuit voltage

电池在常规条件下放置 24 小时，然后使用 4.2 规定的电压表测试电池“+”和“-”两端的电压，测试结果应符合 3-1 要求。

Batteries should be stored for 24 hours at the normal conditions. Then at the same circumstance use voltmeter, specified in 4.2 to measure voltage between "+" and"-". Results should meet the requirement of 3-1.

4.3.4 内阻 Internal resistance

电池在测试环境下放置应不少于 2 小时，然后使用 4.2 规定的电阻计测试电池的内阻。测试值应符合

3-2 要求。

Measure the internal resistance with the resistance meter specified in 4.2 after keeping the battery for 2 hours at least in measurement environment. Internal resistance should meet the requirement of 3-2.

4.3.5 负载电压 Load voltage

电池在常规条件下放置 24 小时，使用 4.2 规定的电压表表笔与 62kΩ 精密电阻并联后，测试电池“+”和“-”两端的电压。测试结果应符合 3-3 要求。

Batteries should be stored for 12 hours at the normal conditions. Then at the same circumstance, parallel connect voltmeter and 62kΩ resistance specified in 4.2 to measure voltage between "+" and"-". Result should meet the requirement of 3-3.

4.3.6 容量测试 Nominal capacity

电池在常规条件下放置应不少于 24 小时，连接使用 4.2 规定的 62kΩ精密电阻进行放电，2.0V 截止，测试结果满足 3-4 要求。

Batteries should be stored for not less than 24 hours at the normal conditions. Then at the same circumstance continually discharge at 62kΩ resistance specified in 4.2 to cut-off voltage 2.0V. Results should meet the requirement of 3-4.

4.3.7 快速放电 Fast discharge duration

电池在常规条件下放置应不少于 24 小时，连接使用 4.2 规定的 3kΩ精密电阻进行放电，2.0V 截止，测试结果满足 3-4 要求。

Batteries should be stored for not less than 24 hours at the normal conditions. Then at the same circumstance continually discharge at 3kΩ resistance specified in 4.2 to cut-off voltage 2.0V. Results should meet the requirement of 3-4.

4.3.8 外观 Appearance

电池满足 2-7 外观要求。

The battery meets the appearance requirements of 2-7.

4.3.9 极端 Terminal

良好的导电性能，无变形。

Good conduction performance, no deformation

4.3.10 温度循环测试 Temperature cycling test

电池放置在试验箱中，经历以下循环测试：在 30min 内从 20±3℃升温到 70±3℃保持 4h，然后用 30min 降温到 20±3℃保持 2h，再用 30min 降温到.-40±3℃保持 4h，最后再用 30min 升温到 20±3℃。如此循环 10 次。试验完毕后在常规条件下电池失重率≤0.2%。

The batteries are to be placed in a test chamber and subjected to the following cycles: raising the chamber temperature to 70±3℃ within 30min and maintaining for 4h, then reducing the chamber temperature to 20±3℃ and maintaining for 2h, then reducing to -40±3℃ and keep it for 4h, at last, raising to 20±3℃ with 30min. Repeat the sequence for a further 10 cycles. Batteries meet the weight loss requirement of ≤0.2%.

5. 安全 Safety

通过美国 UL1642 安全认证测试，认证号为 MH28717

UL1642 recognized component: file No.MH28717.

6. 标志 Mark

6.1 电池类型：CR1225

Battery type : CR1225

6.1 电池商标名称：EVE

Battery brand name: EVE

6.2 极性：+

Polarity: +

7 来料检验 Incoming inspection

EVE 电池在工厂发货之前，会 100%检测电池的开路电压（OCV）以及负载电压。抽样检测电池的容量、视觉外观以及尺寸。

Before shipping, EVE will 100% check open circuit voltage of the battery (OCV) and the load voltage. Also EVE will sampling tests the battery capacity, visual appearance and size.

对于客户端的来料检验，EVE 推荐使用 GB2828.1-2012，GB2829-2002 标准执行。

As for the customer's incoming inspection, EVE recommended sampling according to GB2828.1-2012, GB2829-2002 standard.

表 1 可接受品质水平

Table 1 Acceptability quality level

序号 No	项目 Item	技术要求 Technical request	检测水平 Check level	AQL
1	尺寸 Dimension	2-6	II	1.0
2	外观 Appearance	2-8	II	1.5
3	开路电压 Open circuit voltage	3-1	II	0.65

表 2 抽样数量

Table 2 Sampling amount

批量 Lot size	抽样数量 sampling amount
≤3200	32
3200~10 000	50
>10 000	80

8 包装 Package

根据供需双方协议，按照规定方式方法对电池进行包装，外箱应贴产品标识，产品检验合格标识。

The batteries are packed as the agreement of the customer and supplier. The box should have the eligible identifiers and QC PASS mark.

9 运输 Transportation

本电池出厂时均处于满荷电状态，在运输过程中，应防止倒置、剧烈震动、冲击和挤压，并避免日晒雨淋。

The battery out of factory is full of electric power, so avoid fierce shake, strike and squeeze. Avoid the direct sunshine and raining.

10 注意事项 Warnings and Cautions

锂-二氧化锰电池含有挥发性物质，比如锂金属、有机电解液和其他化学物质。使用操作不当，有可能导致电池发热，起火甚至爆炸，存在人身伤害或损坏的风险。因此，为防止处理电池时发生的事故，必须遵循以下预防措施。

Lithium batteries contain volatile materials such as lithium, organic solvents and other chemical ingredients. Incorrect handling of lithium batteries may result in heat generation, fire or explosion, with the risk of personal injury or damage. To prevent accidents when handling batteries, be sure to follow the following precautions.

●严禁对电池进行短路、充电和正负极反接。

Do not short circuit, charge or make the anode and the cathode reversed.

●严禁强制过放电、挤压、刺穿和焚烧电池。

Do not force-discharge, squeeze, puncture or burn the battery.

●严禁拆卸和解剖电池。

Do not dissemble the battery.

●电池使用至终止电压时应从仪器中及时取出，废旧电池按照国家和当地的法律法规来处理。

The battery should be taken off from instrument when it is consumed to cut-off voltage, and dispose according to local laws, or hand it to professional recycle institution.

●不要混用不同型号的电池。

Do not mix different types of batteries.

●严禁将电池暴露于 85℃以上的高温环境中。

Do not expose the battery in the environment of over 85℃.

●严禁直接在电池上焊锡，请使用引线或者连接镍片点焊的方式。

Do not solder directly onto battery, please use wire or nickel sheet by spot welding.

●将电池贮存于原始包装，以消除任何可能发生的外部短路。

Store the battery by original pack to avoid any possibility of external short circuit.

●不要将电池贮存于导电性防静电袋或泡沫中。

Do not store the battery in ESD bag and foam.

●不要将电池放置在导电金属表面。

Do not store battery in electric metal surface.

●不要将电池堆放在一起，也不允许将贮存盒（/箱）中电池互相接触。

Do not stack or jumble batteries.

●不要将已经连接了任何导线的电池随意装在纸箱或包装带中。

Do not pack battery connected with any kinds of lead random in paper box or pack belt.

●产品应当远离小孩，并尽可能的采取措施防止吞食。

Batteries shall be far away from children, and take measures to prevent the swallow as much as possible.

11 修订 Modification of this specification

修订必须经过双方事先协商，任何争议所造成的问题，在本规格书中既没有定义也没有描述的，应双方共同协商解决。

Modification must be carried out after the prior mutual agreement. All accident or issues caused by any events that are neither defined nor described in this specification, mutual discussion shall take place for the resolution.

12 重要提示 Important notes

1）从出厂日期起贮存 12 个月内，电池保证符合本规格书所涵盖的内容，客户（设备制造商或经销商）任何要求必须在此时期内提出。在此保证期内，如果电池被证明是有缺陷的，EVE 将会及时提供无缺陷合格的电池。

The batteries are warranted to conform to the description contained in this specification for a period of twelve [12] months from the ex-factory date without use, any claim by customer (apparatus manufacturer or distributor) must be pointed out within such period. During that warranty period, if the batteries are proved to become defective under proper stored and handled, EVE will replace the batteries for free.

2）在实际应用中，客户有责任确认和保证电池与装置的匹配性和可靠性。

Customers are responsible to confirm and assure the matching and reliability of batteries under actual application.

3）在以下任何情况下，EVE 将不承担任何责任：客户未能适当处理、操作、安装、测试、维护、检测电池，或者未能遵循本规格书提供的指示、注意事项、注释，以及 EVE 其他的说明和建议。

EVE shall not warrant or be responsible in any case where customers fail to carry out proper handing, operating, installation, testing and maintaining batteries, or don't follow the instruction, cautions, warnings, notes provided in this specification and other EVE's reasonable instructions or advises.

4）此规格书从发行日期起 6 个月内未被退还，则认为已被客户接受，即可生效。

This product specification will be validated assuming that it is accepted when it is not returned within six months from the date of issue.

图 1 CR1225 电池结构

Fig1. Structure of CR1225

（1） 绝缘环（2）负极盖（3）Li 负极

（4）正极盖（5）MnO_2 正极（6）隔膜

（1）gasket（2）negative cap（3）Lithium anode

（4）positive can（5）MnO_2 cathode（6）separator