Specification for Semi-Solid-State Lithium-ion Battery Products

半固态锂离子电池

产品规格书

Cell Model Number/电芯型号: ECP7874172-20Ah

Prepared by PD	Approved by PD	Approved by SLS	Approved by PE	Approved by PQM

Customer Confirmation/客户确认	
Company Name/公司名称	
Print Name/姓名	
Date/日期	

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A1	2024-11-11	/	由7874H2-S01-WL变更为ECP7874172-20Ah 文件编号由JYXN-PS-24007变更为GF-PS-24007
A2	2024-11-17	/	调整极耳长度
A3	2025-08-16	/	极耳外露长度、放电工作温度、不同温度放电特性、室温循环寿命2

CONTENT/目录

1 Scope/适用范围

This document is prepared to specify the specifications of the rechargeable lithium metal battery with Tpenergy’s Part Number,supplied by Shenzhen Tpenergy Electronic Co.,Ltd to customers with their confirmation relevant to the cell products.For the avoidance of doubt the specifications specified here in do not apply to any host device containing the cell products.

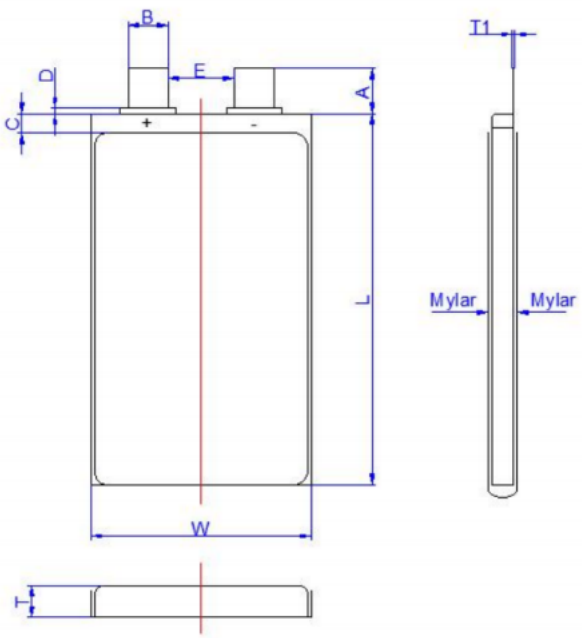
本规格书用于明确深圳拓维信电子有限公司所生产的可充电锂金属电芯的产品规格，并需客户承认。为避免产生疑虑，本规格书不适用于含有该电芯的主机设备。

2 Model Number/型号

ECP7874172-20Ah

3 Cell Drawing/电芯绘图

(Unit/单位: mm)



Items/项目	Description/描述	Dimension/尺寸	
*T	Cell Thickness 电芯厚度	7.8Max（Test by 2000gf PPG）	mm
	Cell Thickness (After cycle specified in item6.1.2)电芯厚度（经过6.1.2项目循环后）	9.4 Max	mm
*W	Cell Width/电芯宽度	75 Max	mm
*L	Cell Length/电芯长度	174 Max	mm
A	Tab Length/极耳外漏长度	19.7~23.0	mm
B	Tab Width/极耳宽度	25±0.5	mm
C	Top Sealing Width/顶封宽度	7.5±1	mm
D	Sealant Length/极耳胶长	0.2~2.5	mm

E	Tab Spacing/极耳间距	11±2.0	mm
T1	Tab Thickness/极耳厚度	Al to Ni Tab/铝转镍极耳： 0.3±0.02（转0.2mm） Ni-plated Cu Tab/铜镀镍极耳： 0.2±0.02	mm
	Bar Code Face/喷码面	Front (deep pit)/正面(深坑面)	
	Shipment of Cell with Protective Tape/ 贴保护膜出货	Yes/是	

4 Standard Environmental Test Conditions/标准测试环境条件

1) Unless otherwise specified, all tests stated in this cell specification are conducted with below temperature and humidity conditions.

Temperature condition: 25 ± 3°C

Humidity condition: 60 ± 20% RH

除非特别说明，本电芯规格书中测试均按以下温度、湿度和环境大气压条件进行：

温度：25 ± 3°C

湿度：60 ± 20% RH

2) In this specification, items with superscript "*" mean these items are only applicable to unused fresh cells within 30 days after manufacture.

本规格书中，带有上标"*"的项目只适用于未经使用的新鲜电芯，且电芯生产时间在 30 天以内

5 Cell Specifications/电芯规格

No.	Items/项目	Specifications/规格	Remark/备注
5.1	Charge Cut-off Voltage 充电截止电压	4.2V	CC/CV
5.2	Nominal Voltage 标称电压	3.6V	CC
5.3	Discharge Cut-off Voltage 放电截止电压	2.6V	CC
5.4	*Rated Capacity *额定容量	20Ah	$0.5C_{min}$ Discharge Capacity $0.5C_{min}$放电容量
5.5	*Typical Capacity *典型容量	20.5Ah	$0.5C_{min}$ Discharge Capacity $0.5C_{min}$放电容量
5.6	Charge Current (Std.) 标准充电电流	$0.5C_{min}$	
5.7	Discharge Current (Std.) 标准放电电流	$0.5C_{min}$	

5.8	Max Charge Current 最大充电电流	$1C_{min}$	
5.9	Max Discharge Current 最大放电电流	$5C_{min}$	
5.10	Max. Momentary Discharge Current 瞬间最大放电电流	$7C_{min}$	秒级（10S）
5.11	Operating Temperature 工作温度	Charge Operating Temperature：0～45℃ 充电工作温度：0～45℃ Discharge Operating Temperature：-40～55℃ 放电工作温度：-40～55℃	
5.12	Storage Temperature 储存温度	≤1 month: -20～45℃ -20℃～45℃下保存≤1个月 ≤6 months: -20～35℃ -20℃～35℃下保存≤6个月 储存相对湿度 Storage Relative Humidity 45~75%	
5.13	Cell Weight/电芯重量	Approx.233±5g （for reference only） 233±5g（参考值）	
5.14	Shipping Voltage/出货电压	3.50~3.60V	
5.15	Initial Impedance/初始内阻	≤2mΩ	

6 Cell Performances and Criteria/电芯性能及标准

Standard Charge：A cell is charged at $0.5C_{min}$ constant current to 4.2V at 25±3℃. Then it is charged at 4.2V constant voltage. Charging shall be terminated when the charging current has tapered to $0.02C_{min}$. The longest charging time shall not be longer than 3 hours.

标准充电： 在环境温度 25±3℃条件下，对电芯以 $0.5C_{min}$ 恒流充电至 4.2V，然后以 4.2V 恒压充电至充电电流小于等于 $0.02C_{min}$，最长充电时间不大于 3h，停止充电。

6.1 Electrical Performances/电性能

No.	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准
6.1.1	*Discharge Performance *放电性能	A cell is stored for 0.5h~1h after standard charge. It is discharge at a constant current of $0.5C_{min}$ or $3C_{min}$ or $5C_{min}$ to ending voltage of 2.6V at 25± 3℃. 电芯标准充电后，搁置0.5h~1h，在25±3℃的环境温度下分别以$0.5C_{min}$、$3C_{min}$、$5C_{min}$恒流放电至截止电压2.6V。	≥100%*C_{min}@$0.5C_{min}$ ≥95%*C_{min}@$3C_{min}$ ≥90%*C_{min}@$5C_{min}$
6.1.2	*RT Cycle Life 1 *室温循环寿命1	A cell is cycled at 25±3℃ as follows: Charge: $1.0C_{min}$ CC to 4.2V, CV to $0.05C_{min}$; Discharge: $3C_{min}$ CC to 2.6V; Charge and discharge suspended between 30 min; Use standard charge and discharge for the every 100th cycle; Carry out 300 cycles. 在25±3℃环境温度下，按照如下步骤进行循环实验：充电：$1.0C_{min}$恒流恒压充电至4.2V，截止电流$0.05C_{min}$；放电：$3C_{min}$放电至2.6V；充放电之间搁置30 min；每100th循环进	Discharge Capacity (300th cycle) ≥ 80%* C_{min} 第300周放电容量 ≥80%*C_{min}

		行一次标准充放电；共进行300次循环。	
6.1.3	* RT Cycle Life 2 *室温循环寿命2	A cell is cycled at room temperature as follows: Charge: 0.5C_{min} CC to 4.2V, CV to 0.05C_{min}; Discharge: 0.5C_{min} CC to 2.6V; Charge and discharge suspended between 30 min; Use standard charge and discharge for the every 100th cycle; Carry out 500 cycles. 在室温下，按照如下步骤进行循环实验：充电：0.5C_{min}恒流恒压充电至4.2V，截止电流0.05C_{min}；放电：0.5C_{min}放电至2.6V；充放电之间搁置30 min；每100th循环进行一次标准充放电；共进行500次循环。	Discharge Capacity (500th cycle) ≥ 80%* C_{min} 第500周放电容量 ≥80%*C_{min}
6.1.4	Different Temperature discharge Characteristics 不同温度放电特性	After standard charge, a cell is stored in an environment of specific temperature for 2 hours, then 0.5C_{min} CC to X V. 电芯在经过标准充电后，储存在特定温度的环境中2h，然后以0.5C_{min}恒流放电至截止电压X V。	Discharging Capacity (55℃) ≥ 98%*C_{min}@2.6V 55℃放电容量 ≥98%*C_{min}@2.6V Discharging Capacity (-20℃) ≥ 70%*C_{min}@2.6V -20℃放电容量 ≥70%*C_{min}@2.6V Discharging Capacity (-40℃) ≥ 55%*C_{min}@2.4V -40℃放电容量 ≥55%*C_{min}@2.4V
6.1.5	Different Temperature charge Characteristics 不同温度充电特性	After standard discharge, a cell is stored in an environment of specific temperature for 2 hours, then X C_{min} CC to 4.2V, CV to 0.05C_{min} 电芯在经过标准放电后，储存在特定温度的环境中2h，然后以X C_{min}恒流恒压充电至4.2V，截止电流0.05C_{min} 。	Charging Capacity (0℃) ≥ 80%*C_{min} 0℃充电容量 ≥80%*C_{min}@0.1C_{min} Charging Capacity (45℃) ≥ 95%*C_{min} 45℃充电容量 ≥95%*C_{min}@1C_{min}

6.1.6	Charge (Capacity) Retention 荷电保持能力	A cell is stored at 25±3℃ for 28 days after standard charge. After storage, place the cell at 25±3℃, measured the residual capacity with 0.5C_{min} till 2.6V. Measure the recovery capacity with 0.5C_{min} till 2.6V after standard charged the cell again. 电芯在经过标准充电后，于25±3℃的环境温度下搁置 28 天后，25±3℃的环境温度下，进行0.5C_{min}标准放电到2.6V测试残余容量，再进行一次标准充放电测试恢复容量。	Residual Capacity ≥90%*C_{min} 残余容量≥90%*C_{min} Recovery Capacity ≥95%*C_{min} 恢复容量≥95%*C_{min}

6.2 Mechanical Performances/机械性能

No.	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准
6.2.1	Low Pressure Test 低气压	A cell is put into a vacuum box at 25℃±3 ℃ after standard charged. Gradually decreasing the internal pressure of vacuum box until it is less than 11.6kPa (Simulation of Elevation Height 15240m), and keeping for 6 hours. 电芯标准充电后在25℃±3℃的环境温度下，将其搁置在真空箱中。逐步减小真空箱内部压力至不高于11.6kPa（模拟海拔15240m）并保持6h。	No leakage No fire No explosion 不漏液 不起火 不爆炸
6.2.2	Vibration Test 振动测试	A fully charged cell is to be subjected to simple harmonic motion with an amplitude of 0.8mm (0.03inch) [1.6mm(0.06inch) total maximum excursion]. The frequency is to be varied between 10 and 55 hertz, and return in not less than 90 nor more than100 minutes. The cell is to be tested in three mutually perpendicular to each axis. 电芯满充后，固定于振幅为0.8mm（总振程1.6mm）的简谐振动台，沿样品互相垂直的3个方向对电芯做振动测试，振动频率从10到55Hz之间线性往复变化，振动时间大于90分钟小于100分钟。	No fire No explosion 不起火 不爆炸
6.2.3	Flat Crush Test 平面挤压测试	Charge the cell as per standard charge method. Then the cell is to be crushed between two flat surfaces. The force for the crushing is to be applied by a hydraulic ram or similar force mechanism. The flat surfaces are to be brought in contact with the cells' wide sides and the crushing is to be continued until an applied force of 13±1kN(3000 ±224 lbs) is reached. Once the maximum force has been obtained it is to be released, then rest for 1 hours at 25±3℃. 电芯标准充电后，将电芯放置在两个平行板中间进行挤压。压力通过液压油缸或其它的机械装置实现，平行板表面与电池的宽面接触，逐渐加压至13 ±1kN (3000 ±224 lbs)，然后释压，25±3℃下静置观察1h。	No fire No explosion 不起火 不爆炸

6.3 Safety Performances/安全性能

No.	Items/项目	Test Method and Condition/测试方法及条件	Criteria/标准
6.3.1	*External Short Test *外短路测试	Each fully charged sample cell is to be short-circuited by connecting the positive and negative terminals of the cell with a circuit load having a resistance load of 80±20 mΩ. The cell is kept in short-circuited until a fire or explosion is obtained, or until it has reached a completely discharged state of less than 0.2 V and the cell surface temperature has returned to ±10°C (±18°F) of ambient temperature. Tests are to be conducted at 55 ±5°C (131±9°F). The cells are to reach equilibrium at 55 ±5°C, as applicable, before the terminals are connected. 满充电芯通过阻抗为80±20 mΩ的负载电路直接连接正负极极耳。当电芯起火或爆炸，或电芯比完全放电状态的电压低0.2V和电芯表面温度跟环境温度相差±10°C时，终止测试。测试在环境温度为55±5°C (131±9°F)温度下进行。	No fire No explosion 不起火 不爆炸
6.3.2	*Over Charge Test *过充测试	A sample cell is standardly charged to charge cut-off voltage and rested for 5 min. Then it is charged at $3C_{min}$ to 4.6V, and kept at 4.6V until the charge time is ≥7 hours or the cell surface temperature is 20% lower than peak value. 电芯常规充电至充电截止电压并静置5分钟，然后以$3C_{min}$充电至4.6V并保持充电，当充电时间达到7小时，或电芯表面温度低于最高温度的20%时，停止测试。	No fire No explosion 不起火 不爆炸
6.3.3	Forced-Discharge Test 强制放电	Under 25°C±3°C, a cell is discharged to 2.6V at $0.5C_{min}$. Then, it is reversely charged at $1C_{min}$ for 90min. 在25°C±3°C的环境温度下，电芯以$0.5C_{min}$进行放电至2.6V，然后以$1C_{min}$的电流进行反向充电90min。	No fire No explosion 不起火 不爆炸
6.3.4	Temperature Cycling Test 温度循环测试	After the charging specified in the specifications, stored the cell in condition of 25±3°C temperature control box in the following : a) The sample is placed in a temperature of 75± 2°C experimental chamber and is maintained for 6h; b) The test oven temperature down to -40± 2°C, and keep 6h; c) Temperature conversion time is not more than 30min; d) Repeating steps a) ~ b), a total is 10 cycles; 电芯按规格书规定充电，将充满的电芯放置在温度为25±3°C的温控箱体中进行如下： a) 将样品放入温度为75±2°C的实验箱中保持6h； b) 将实验箱温度降为-40±2°C，并保持6h； c) 温度转换时间不大于30min； d) 重复步骤a)~b)，共循环10 次；	No leakage No fire No explosion 不漏液 不起火 不爆炸

6.4 Visual Inspection/外观

There shall be no defects such as deformation, scratch, corrosion and leakage, which may jeopardize the performance of cell.

电芯外表应无变形、刮擦、腐蚀和漏夜等会危及电芯性能的不良现象。

6.5 Guarantee Period of Quality/质量保质期

Guarantee period of quality of cell is 12 months after sold.

电芯保质期为出厂后12个月内。

7 Technical and Safety Requirements/技术和安全要求

Statement 1) Customers are required to apply the cells under the conditions described in this Cell Specification. Otherwise, customers are requested to consult TPEnergy to evaluate the risk to use the cells in other application conditions.

声明1）：**用户需在本电芯规格书规定的使用环境下使用电芯。如需在规定之外的环境下使用，用户需向拓维信电子咨询评估风险。**

Statement 2) TPEnergy will take no responsibility for any accident when the cell is used under other conditions than those described in this Cell Specification.

声明2）：**在本规格书规定环境之外使用电芯发生的意外，本公司不承担责任。**

7.1 Charge/充电

7.1.1 Charge Current /充电电流

Charge current for a single cell should be less than the maximum charge current specified in this cell specification.

单电芯的充电电流应该小于本规格书所标明的最大充电电流。

7.1.2 Charge Voltage 充电电压

Charge voltage for a single cell shall be less than that specified in this cell specification. Higher charge voltage must be strictly prohibited. The charger and protection circuit of battery pack shall be designed to comply with this voltage limitation.

单电芯的充电电压必须低于本规格书所标明的充电截止电压。超过规定充电电压必须被严格禁止。充电器和电池pack的设计也必须严格遵守充电电压的限制。

7.1.3 Charge Temperature/充电温度

Cells shall be charged according to the temperature condition specified in this cell specification. Charging at temperature lower or higher than the specified temperature windows shall be prohibited.

电芯的充电温度必须严格遵守本规格书规定之温度，在高于或低于规定的温度区间充电都必须禁止。

7.1.4 Prohibition of Reverse Charge /禁止反向充电

Reverse charge is prohibited. Reverse charge will damage the cells' chemical system, and may lead to gassing, over-heat, fast capacity degradation, and even catching fire.

禁止反向充电。反向充电会破坏电芯的化学体系，并可能导致产气、过热、快速容量衰减甚至着火。

7.1.5 Prohibition of Charge to 0V Cells /禁止0V充电

Cell is prohibited to be charged when its voltage is 0V.

当电芯电压降至0V时，禁止对电芯充电，

7.2 Discharge/放电

7.2.1 Discharge Current/放电电流

Discharge current shall be not over the maximum discharge current specified in this cell specification. Higher discharging current may cause cell over-heat and fast capacity degradation.

放电电流不能超过本规格书规定的最大放电电流。过大的放电电流会导致电芯过热和快速容量衰减。

7.2.2 Discharge Temperature/放电温度

Cells shall be discharged according to the temperature condition specified in this cell specification.

电芯放电温度必须遵守本规格书所规定的电芯放电温度条件，

7.2.3 Over Discharge/过放

Cells could be in an over-discharge status due to self-discharge in long time storage. So cells shall be charged periodically to keep the voltage above 2.6V to prevent over-discharge. Over-discharge may cause fast capacity degradation and gassing.

由于电芯的自放电，长期储存的电芯可能会处于过放电状态。因此长期储存的电芯应定期充电，保证电压处于2.6V以上，防止电芯过放电。过放电会导致电芯产气以及快速容量衰减。

7.3 Protection Functions for Batteries and Host Devices/电池和主机的保护功能

Below protection functions are required for battery packs and host devices to keep the cells under safe usage conditions: over charge protection, over discharge protection, over current protection, over heat protection, and short circuit protection.

电池pack或主机应具备以下保护功能，以保证电芯处于安全的使用环境：过充保护、过放保护、过流保护、过热保护以及短路保护。

7.3.1 Over Charge Protection/过充保护

Over-charge protection shall be triggered and stop charging if the cell voltage reaches charge cut-off voltage. The host devices and battery pack shall be designed to indefinitely withstand the maximum voltage from the adapter, under a single fault condition, to prevent a cascading failure through the system to the battery pack and/or cell.

当电芯电压达到充电截止电压时，过充保护功能可以触发并停止充电。电池pack和主机应能承受来自充电器的最大电压以防止因系统连锁故障而导致电池pack或电芯失效。

7.3.2 Over Discharge Protection/过放保护

Over-discharge protection shall be triggered and stop discharging if the cell voltage is lower than the threshold of over-discharge cut-off voltage.

当电芯电压低于过放截止电压的阈值时，过放保护功能可以触发并停止充电。

7.3.3 Over Current Protection/过流保护

Over current protection shall be triggered and stop discharging when the charge current is higher than the specified current limitation. The battery pack shall have at least one over current protection circuit or device designed to prevent the cell to be charged with higher current than the specified charge current.

当充电电流高于规定的充电上限电流时，过流保护能可以触发并停止充电。电池pack或主机至少具备一重过流保护功能。

7.3.4 Over Heat Protection /过热保护

At least one thermal protection device or mechanism is required for the battery pack or host device. For a thermistor type temperature protection circuit, all packs of the same model shall have the same voltage to temperature translation (acceptable tolerance no more than ±10%), with consideration for any temperature lag over time.

电池pack或主机至少具备一种热保护装置或机制。对于热敏电阻类温度保护电路，所有的pack应该具有相同的电压温度转换系数，可以接受的公差范围为±10%，同时应考虑温度的时间滞后效应。

During charge and discharge, the temperature of the cell shall be monitored. When temperature limitations are exceeded, action shall be taken to mitigate hazards. Action should include shutdown, or disabling of charging, or other protective action. The action may be taken by the battery pack and/or host.

在充放电过程中，应监测电池的温度。当超过温度限制时，应采取措施减轻危害。行动应包括关机，或禁用充电，或其他保护行动。该动作可由电池组和/或主机执行。

7.3.5 The Limitation of Charge Time/充电时间限制

In order to prevent abnormal cells or battery packs, charge time shall be limited. When time limitation is reached, the host device or the battery pack should stop charging.

为防止异常电芯或pack，应设定充电上限时间。当充电时间达到上限时间时，主机或pack应停止充电。

7.3.6 Pre-Charge Function/预充电功能

The system shall not initiate normal charging if the battery voltage is below the over-discharge protection voltage. In this case, the system may support a pre-charging function to increase the battery voltage above the specified threshold. The pre-charge method is shown below:

Cell is charged with a small current (≤ $0.02C_{min}$) for approximately 30 minutes. When the voltage reaches 2.6V, cell can be charged with normal current. In case the (individual) cell voltage cannot rise to 2.6V within the pre-charging time, then the charger shall have functions to stop further charging and display the cell/pack is at abnormal state.

如果电池电压低于过放保护电压，系统应该禁止常规充电，而启动预充电模式。预充电模式下，用小电流（≤ $0.02C_{min}$ ）充电，当电压达到2.6V时，启动常规充电方式。如果(个别)电池在预充电时间内电压不能上升到2.6V，则充电器应具有停止继续充电并显示电池/电池组处于异常状态的功能。

7.4 Notice for Battery Pack Design/电池 pack 设计建议

7.4.1 Tab Welding/极耳焊接

1) Ultrasonic welding, laser welding or spot welding is recommended to connect cells with PCM or other parts.

1) 建议使用超声焊接、激光焊接以及点焊方法来焊接电芯和PCM或其它部件。

7.4.2 Cell Fixing/电芯固定

1) Cells are not allowed to be movable in the battery pack.

1) 电芯在pack中不允许有移动现象。

2) Short circuit of cell in a battery pack or host device are not allowed. Insulation layers between wiring and the cell are required to prevent short circuit. The battery pack or host device shall be structured without any potential short circuit.

2) 禁止电芯在电池pack或主机中出现短路，电芯和线路间要有绝缘层防止短路，电池pack和主机要从结构上做防短路设计。

8 Handling Precautions and User's Guidelines/操作注意和用户指引

8.1 Storage of Cells/电芯储存

Cells shall be stored at the temperature condition and the humidity condition specified in this cell specification always. The voltage for long time storage shall be between 3.2V and 3.6V .

电芯应在本规格书规定的温度和湿度条件下储存。长期储存的电芯电压应保持在3.2V和3.6V之间。

8.2 Handling of Cells/电芯操作

8.2.1 The aluminum-polymer packing foil can be damaged by sharp stuffs such as Ni-tabs, pins and needles or other tooling and fixtures.

铝塑包装膜易受尖锐物（如Ni极耳、大头针或其它工装夹具）损伤

1) Do not scratch or touch cells with any sharp stuff.

请勿用尖锐物体接触或刮擦电芯。

2) Wear gloves before taking cells.

拿取电芯前需戴手套。

3) Clean worktable to make sure that there is no sharp particle.

工作台确保无尖锐颗粒。

8.2.2 Do not bend or fold the top sealing section. It will damage the top sealing and cause leakage.

请勿弯折电芯顶封处，易造成顶封破损漏液。

8.2.3 Don't unfold the side sealing edge. Or the aluminum layer of the packing foil will be damaged, which will lead to leakage.

请勿展开侧封边，否则铝塑包装膜中铝层会受损并引起漏液。

8.2.4 Don't fold or bend cell tabs. Tabs are fragile and may be broken after folding or bending.

请勿弯折电芯极耳，极耳较脆弱，弯折极耳易造成损伤。

8.2.5 Do not drop or bend cell.

请勿弯折或跌落电芯。

8.3 User's Guidelines/用户指引

8.3.1 Below user's guidelines shall be made available to the battery users with the cell inside through one or more of the following methods properly: printed on the battery label, printed on the host device label, printed in the user's manual, or posted in a help file or Internet website:

以下用户指引应通过电池标签、主机标签、印刷用户手册、帮助文件或网站等形式提供给用户：

1) Do not disassemble or open, crush, bend or deform, puncture, or shred cells, which may cause cell internal short circuit and lead to firing.

1) 请勿拆解或打开、挤压、弯折或扭曲或剪切电芯。上述行为会导致电芯内短路并导致起火。

2) Do not modify or remanufacture, attempt to insert foreign objects into the battery cell,

2) 不要改变或改造电芯，不要尝试把异物插入电芯。

3) Do not immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.

3) 不要置电芯于水或其它液体中，或暴露在火、爆炸或其它危险环境中。

4) Only use the battery for the system for which it was designed.

4) 只在为其所设计的体系中使用该电芯。

5) Only use the battery with a charging system that has been qualified with the system per standard. Use of an unqualified battery or charger may present a risk of fire, explosion, leakage, or other hazards.

5) 只使用经过认证合格的充电系统充电，使用未经认证的充电器会导致起火、爆炸、漏液等危险。

6) Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.

6) 请勿短路电池或允许导电金属物接触电池的正负极端子。

7) Replace the battery only with another battery that has been qualified with the system. Use of an unqualified battery may have a risk of fire, explosion, leakage, or other hazards.

7) 使用经过系统认证合格的电池取代现有电池，使用未经认证的电池会有起火、爆炸、漏液等危险。

8) Promptly dispose of used batteries in accordance with applicable local regulations.

8) 合理处置废旧电池或遵照本地规范处置。

9) Battery usage by children should be supervised.

9) 儿童应在大人监管下使用电池。

10) Improper battery use may result in a fire, explosion, or other hazard.

10) 不合理地使用电池有导致起火、爆炸等危险。

11) In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.

11) 电池发生泄漏时，请勿让电池液体接触到皮肤或眼睛。如不幸发生，应立即用大量水冲洗，并寻求医生帮助。

12) Seek medical advice immediately if a battery has been swallowed.

12) 如发生吞咽电池，应立即寻求医生帮助。

8.3.2 The following indications, notifications, and dialogue/messages, at the system level, or an equivalent statement, may be displayed along with recommended actions as appropriate:

以下提示、告知、对话或信息应在系统层面或相似的声明并结合建议措施一同展示出来：

1) Abnormal battery temperature alert.

电池温度异常警告。

2) Abnormal host device and/or battery DC input voltage alert.

主机和/或电池输入直流电压警告。

3) Abnormal current draw alert.

3) 放电电流异常警告。

4) Battery communication fail/time-out alert.

4) 电池通讯失效或超时警告。

5) Incompatible battery alert.

5) 不兼容电池警告。

6) Alert for other malfunctions that may lead to hazards.

6) 其它可能导致危险的功能异常警告。

8.4 Others/其它事项

8.4.1 Never incinerate nor dispose the cell in fire. It may cause cell explosion.

请勿焚烧电池或置电池于火中，可能会导致爆炸。

8.4.2 Never try to replace the battery. The battery replacement can only be done by the technicians with professional training.

请勿尝试置换电池。电池置换只能由经过专业培训的人员进行。

8.4.3 Prohibition to Use Damaged Cells

The cells might be damaged during shipping. If any abnormal phenomenon is found, such as deformation of the cell package, smelling of electrolyte, electrolyte leakage and others, the cells shall never be used any more.

禁止使用破损电芯

电芯在运输过程中可能会受到损伤，如电芯发现任何异常现象，如电芯包装变形，闻到电解液气味，电解液泄漏等，电芯应立即报废不得使用。