



圆柱型锂离子电芯规格书

SPECIFICATION OF PRODUCT

for Lithium-ion Rechargeable Cell

电芯型号: INR18650-26E

Model :INR18650-26E

Customer Approval 客户认同	Signature签名	Date日期
	Company Name: 公司名称 :	
Company Stamp: 公司印章 :		

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	上 君		

正式受控文件
 受控号 **00015**



1、Scope 适用范围

This product specification has been prepared to specify the Cylindrical Lithium-ion Cell to be supplied to the customer by HENGDIAN GROUP DMEGC MAGNETICS Co.,Ltd.

本规格书适用于由横店集团东磁股份有限公司生产的圆柱型锂离子电芯。

2、Description and Model 型号及说明

2.1 Description 说明 Cell(Cylindrical Lithium-ion Cell) 圆柱型锂离子电芯

2.2 Model 电芯型号 INR18650-26E

2.3 Site 产地 Manufactured in Zhejiang, China

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3、Nominal Specification 常规特性

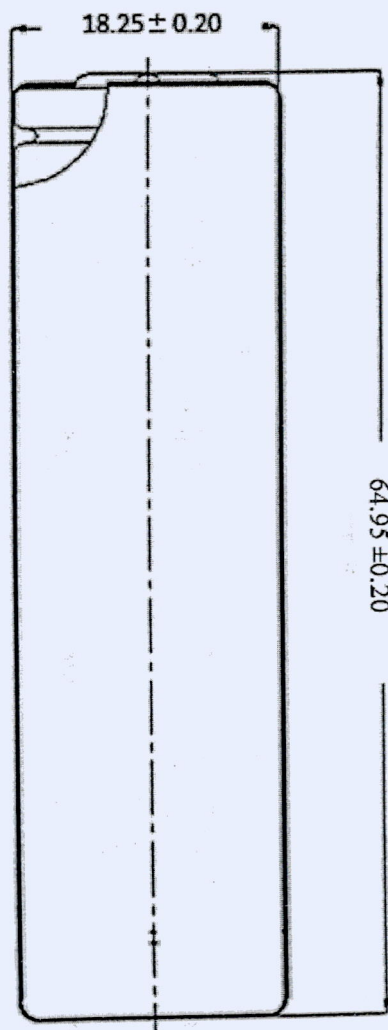
NO. 序号	ITEMS 项目	SPECIFICATION 参数
3.1	Nominal Capacity (Typical) 标称容量	2600mAh@0.5C
3.2	Nominal Capacity (Minimum) 最小容量	2500mAh@0.5C
3.3	Nominal Voltage 标称电压	3.65V
3.4	Charging Voltage 充电电压	4.2 ±0.05 V
3.5	Charging Method 充电方式	CC-CV (0.5C, 4.2V, 0.05C cut-off) 恒流恒压充电 (电芯以 0.5C 恒流充电至 4.2V 转恒压充电, 截止电流 0.05C)
3.6	Standard Charge Current 标准充电电流	0.5 C
3.7	Discharge Cut-off Voltage 放电终止电压	2.75 ± 0.05 V
3.8	最大持续充电电流 Maximum Continuous Charging Current	2C (Not for cycle life)
3.9	最大持续放电电流 Maximum continuous discharge current	15A@RT
3.10	Max pulse discharge current (<1s) 最大瞬间放电电流	20A@RT
3.11	Internal Resistance 内阻	< 25 mΩ(ACIR)
3.12	Cycle Life 循环性能	+0.5C/-1C Cap(1000th)/Cap(Av10) ≥ 80% +0.5C/-10A Cap(300th)/Cap(Av10) ≥ 80% +0.5C/-13A Cap(250th)/Cap(Av10) ≥ 80%



3.13	Operating Temperature 工作温度	Charge 充电时: 0 to 50°C Discharge 放电时: -20 to 60°C
3.14	Weight 重量	<47 g
3.15	Cell Dimension 电芯尺寸	Height (高度) : 64.95mm±0.20 mm Diameter (直径) : 18.25 mm±0.20 mm Refer to the attached drawing 1 参考附图 1
3.16	Storage Environment 存储环境	1 year : -20~25°C ≤70%RH 3 months : -20~45°C ≤70%RH 1 month : -20~55°C ≤70%RH

4、Outline Dimensions 外形尺寸

See the Attached drawing1 附图 1 单位: mm



正式受控文件
受控号 00015

5、Standard Test Conditions 标准试验条件



5.1 Environmental Conditions

Unless otherwise specified, all tests stated in this specification are conducted at temperature 25±5°C and humidity 65±20%.

除非有特殊说明，所有测试的环境条件要求如下，温度：25±5°C、湿度：65±20%。

5.2 Measuring Instrument Requirements 测量仪表要求

Voltage meter: The voltage tester internal resistance is ≥ 10 KΩ/V.

电压仪表要求：测量电压的仪表内阻不小于 10KΩ/V。

The voltage and current measurement device accuracy grade : 0.5mV and 0.5mA or higher.

电压、电流测量仪器精度等级：不低于 0.5mV 和 0.5mA。

AC Impedance meter : 1KHz.

交流阻抗仪测量频率：1KHz。

Temperature meter precision : ≤0.5°C.

温度测试仪精度：≤0.5°C。

Slide caliper : 0.01mm.

游标卡尺精度：0.01mm。

Electronic scale : 0.1g.

电子秤精度：0.1g。



6、Characteristics 特性

6.1 Standard Charge 标准充电

This "Standard Charge" means charging the cell with charge current of 0.5C and constant voltage 4.20V at 25°C, 0.05Ccut-off.

标准充电指电芯在 25°C 环境下以 0.5C 电流恒流充电至 4.2V 转恒压充电，恒压充电的截止电流为 0.05C。

6.2 Temperature Dependence of Discharge Capacity 不同温度下的放电容量

Discharge capacity comparison at each temperature, measured with discharge constant current 0.2C and 2.75V cut-off with follow temperature after the standard charging at 25°C. (Constant current discharge to 2.5V cut-off at -20°C)

电芯在 25°C 环境下标准充电后，在下列温度下以 0.2C 电流放电至 2.75V，对比各个温度下的放电容量。（备注：-20 度放电至 2.5V）

Charge Temperature	Discharge Temperature				
	-20°C	-10°C	0°C	25°C	55°C
Relative Capacity	≥70%	≥75%	≥80%	100%	≥90%

Note: If charge temperature and discharge temperature is not the same, the interval for temperature change is 2 hours.
备注：如果充电温度和放电温度不同，电芯在放电前需要先搁置至少 2h。

6.3 Discharge Rate Capabilities 倍率放电

Discharge capacity is measured with the various currents in under table and 2.75V cut-off after the Standard charge at 25°C.

电芯在 25°C 环境下标准充电后，以下表中的不同电流放电至 2.75V 的放电容量。



Current 电流	0.2C	0.5C	1C	8A	13A
Relative Capacity 容量比率	≥100%	≥98%	≥96%	≥94%	≥92%

6.4 Cycle Life1 循环寿命 1

Each cell is charged in accordance with 6.1, and stored for 5 minutes, then discharged to cut-off voltage 2.75V at a constant current of 1C, after that, stored 5 minutes prior to next charge/discharge cycle. The cell shall be continuously charged and discharged for 1000 times.

电芯按 6.1 规定充电结束后, 搁置 5min, 然后以 1C 电流放电至终止电压 2.75V, 放电结束后, 搁置 5min, 再进行下一次充放电循环, 连续进行充放电循环 1000 次。

After 1000 cycles, Capacity Retention = $\frac{Cap(1000th)}{Cap(Av10)} \geq 80\%$
1000 次循环后, 容量保持率 ≥ 80%。

6.5 Cycle life2 循环寿命 2

Each cell is charged in accordance with 6.1, and stored for 10 minutes, then discharged to cut-off voltage 2.75V at a constant current of 10A, after that, stored 30 minutes prior to next charge/discharge cycle. The cell shall be continuously charged and discharged for 300 times.

电芯按 6.1 规定充电结束后, 搁置 10min, 然后以 10A 电流放电至终止电压 2.75V, 放电结束后, 搁置 30min, 再进行下一次充放电循环, 连续进行充放电循环 300 次。

After 300 cycles, Capacity Retention = $\frac{Cap(300th)}{Cap(Av10)} \geq 80\%$
300 次循环后, 容量保持率 ≥ 80%。

6.5 Cycle life2 循环寿命 3

Each cell is charged in accordance with 6.1, and stored for 10 minutes, then discharged to cut-off voltage 2.75V at a constant current of 13A, after that, stored 30 minutes prior to next charge/discharge cycle. The cell shall be continuously charged and discharged for 250 times.

电芯按 6.1 规定充电结束后, 搁置 10min, 然后以 13A 电流放电至终止电压 2.75V, 放电结束后, 搁置 30min, 再进行下一次充放电循环, 连续进行充放电循环 250 次。

After 250 cycles, Capacity Retention = $\frac{Cap(250th)}{Cap(Av10)} \geq 80\%$
250 次循环后, 容量保持率 ≥ 80%。

6.7 Storage Characteristics 1 存储特性 1

Capacity after storage for 7 days at 55±2 °C after the Standard charged measured with discharge current 1C with 2.75V cut-off at 25°C.

电芯标准充电后, 在 55±2 °C 环境下存储 7 天, 然后在 25°C 环境下以 1C 放电至 2.75V 测试容量保持率和恢复率。

$$\text{Capacity retention} = \frac{\text{Residual capacity after the storage}}{\text{Initial Capacity}} \geq 85\%$$

$$\text{容量保持率} = \frac{\text{存储后剩余容量}}{\text{初始容量}} \geq 85\%$$

$$\text{Capacity recovery} = \frac{\text{Recovery capacity after the storage}}{\text{Initial Capacity}} \geq 90\%$$

$$\text{容量恢复率} = \frac{\text{存储后恢复容量}}{\text{初始容量}} \geq 90\%$$





6.8 Storage Characteristics 2 存储特性 2

Capacity after storage for 28 days at 25±2 °C after the Standard charged measured with discharge current 1C with 2.75V cut-off at 25°C.

电芯标准充电后，在 25±2 °C 环境下存储 28 天，然后在 25°C 环境下以 1C 放电至 2.75V 测试容量保持率和恢复率。

$$\text{Capacity retention} = \frac{\text{Residual capacity after the storage}}{\text{Initial Capacity}} \geq 85\%$$

$$\text{容量保持率} = \frac{\text{存储后剩余容量}}{\text{初始容量}} \geq 85\%$$

$$\text{Capacity recovery} = \frac{\text{Recovery capacity after the storage}}{\text{Initial Capacity}} \geq 90\%$$

$$\text{容量恢复率} = \frac{\text{存储后恢复容量}}{\text{初始容量}} \geq 90\%$$

6.9 Status of the cell as of ex-factory 电芯出厂状态

The cell should be shipped in 3.500V ~ 3.700V Charging voltage range.

电芯运输过程中，电压应在 3.500V ~ 3.700V 范围内。



7、Safety 安全性能

All below tests are carried out on the equipment with forced ventilation and explosion-proof device. Before test, all cells should be charged in accordance with 6.1, and stored 24 hours prior for testing.

下述试验应在有强制排风条件及防爆措施的装置内进行，在试验前所有的电芯都按 6.1 规定标准充电方式充电，并搁置 24h 后，再进行以下试验。

Test Item 测试项目		Test Method 测试方法	Criteria 测试标准
7.1	Crush Test 挤压测试	A 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 and the crushing is to be continued until an applied force of 13 ± 1 KN is reached. Once the maximum force has been obtained is to be released. 将电芯置于两个挤压平面之间，用液压油缸或类似的力挤压，挤压面与电芯接触，逐渐增加压力值 13 ± 1KN 后停止。	No explosion, no fire 不起火、不爆炸
7.2	Heating Test 加热测试	A cell is to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of 5°C per minute to a temperature of 130±2°C and remain for 30 minutes and observed for 1 hour. 将电芯放在电热鼓风干燥箱中加热，温度以 5°C/min 的速率由室温升至 130°C 并保持 30min，观察 1h。	No explosion, no fire 不起火、不爆炸



7.3	Over-charge Test 过充电	The cell is discharged according to the standard discharge method. Apply a 1C Constant current 12V constant voltage charge for 1.5h. 电芯按照标准放电方式放完后, 采用1C和12V的恒流恒压充电1.5小时。	No explosion, no fire, no leakage 不起火、不爆炸、不漏液
7.4	Short-circuit Test 短路测试	Short-circuit the standard charged cell by connecting positive and negative terminal 10min by less than 5mΩ wire. 短接电芯的正负极10min, 外部线路总电阻小于5mΩ。	No explosion, no fire 不起火、不爆炸
7.5	Low Pressure 低气压	Each fully charged cell is placed in a vacuum chamber with the ambient temperature (20±5℃). Once the chamber has been sealed, its internal pressure is gradually reduced to a pressure equal to or less than 11.6KPa held at that value for 6 hours. And it need take 1 hour to observe. 将电芯放入温度为20±5℃的低气压箱中, 调节试验箱中气压为11.6KPa, 静置6h后观察1h。	No explosion, no fire, no leakage 不起火、不爆炸、不漏液
7.6	Seawater Immersion 海水浸泡	Each fully charged cell is immersed in 3.5% NaCl solution(weight percent, this solution concentration is same to seawater) for 2 hours. 将电芯完全浸没于质量分数为3.5%NaCl溶液中, 浸泡2h。	No explosion, no fire 不起火、不爆炸
7.7	Temperature Cycling 温度循环	The fully charged cell shall be stored at the test temperature of 75±2℃ for at least 6 hours, and then at the test temperature of -40±2℃ for at least 6 hours. The maximum time interval between the two extreme test temperatures is 30 minutes. This procedure must be repeated 10 times, followed by the storage of all test cells and battery packs at ambient temperature (20±5℃) for 24 hours 满电电池在试验温度为75±2℃下存放至少6小时, 接着在试验温度为-40±2℃下存放至少6小时。两个极端试验温度之间的最大时间间隔为 30 分钟。这一程序须重复 10 次, 接着将所有试验电池和电池组在环境温度 (20±5℃) 下存放 24 小时	No explosion, no fire, no leakage 不起火、不爆炸、不漏液

正式受控文件
受控号: 00015



7.8	Drop Test 跌落测试	At normal temperature, the fully charged fresh cell will fall freely onto the cement road surface at a drop height of 1.5m. The two end surfaces of the cell dropped once each, and the cylinder dropped 4 times. A total of 6 drop tests were carried out, and the appearance was observed after the experiment was placed for 24h. 常温下将充满电的新鲜电芯按 1.5m 的跌落高度自由落体跌落于水泥路面上。电芯两个端面各跌落 1 次，圆柱面跌落 4 次，共计进行 6 次跌落试验，实验放置 24h 再观察外观。	No explosion, no fire 不起火、不爆炸
7.9	Over-discharge Test 过放测试	A cell is charged in accordance with 6.1, then discharged by 1C(2600mA) current for 90 min and observed for 1 hour. 电芯按6.1规定充电结束后，以1C电流放电90min，观察1h。	No explosion, no fire, no leakage 不起火、不爆炸、不漏液
7.9	Vibration characteristics 振动性能	After standard fully charge, cell shall be attached to a vibration table directly and subjected to vibration that consists of 10 Hz to 55 Hz to 10 Hz at the speed of 1Hz/min in 180-200mins. The total excursion of the vibration is 0.8mm (0.060 inches). The cell shall be vibrated in each direction along axis of the cylinder and the vertical directions of axis of the cylinder. 将满电电芯放在振动实验台上，在180~200mins由10 Hz到55 Hz再到10Hz以1Hz/min的速率变化，振幅为0.8mm(0.060英寸)进行振动实验。电芯在电芯的轴向和与电芯轴向垂直的两个方向上振动。	No explosion, no fire, no leakage 不起火、不爆炸、不漏液

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受控号 00015

8、Warranty 保证

Cells are guaranteed to be free from defects in workmanship and materials for a period of 1 year provided that the manufacturer can confirm such defects are resulted from manufacturing abnormality, not from abusive usage, or else manufacturer will solve the quality problem. DMEGC won't replace a new cell for free if the defects are not due to the failure of manufacturing process or is due to customer's abuse or misuse.

电芯正常使用 1 年内，经确认出现任何由于制造而非滥用原因造成的质量问题，均由生产厂方予以解决。此期限外，非制造原因而是客户误用造成的电芯质量问题，东磁不承诺免费更换。

For the sake of safety assurance, please discuss the equipment design, its system and protection circuit of Lithium-ion cell with DMEGC in advance and consult about the high rate current, rapid charge and special application in the same way.

为了安全起见，如有设备设计、电芯系统保护或大电流、快速充电和其它方面的特殊应用，请先咨询东磁公司相关事宜，

DMEGC will not be responsible for trouble occurred by against the precautions in instructions.

东磁公司对违反安全守则操作所产生的问题不承担任何责任。

DMEGC will not be responsible for trouble occurred by matching problems with electric circuit, cell pack and charger.
东磁公司对于电路，电池组以及充电器搭配使用所产生的问题不承担任何责任。



DMEGC will be exempt from warranted any defect cells during assembling after acceptance.
东磁公司对于出货后客户在电芯组装过程中产生的不良电芯不予以质量保证。

9、 Others 其它

9.1 Storage for a long time 长时间存储

If the cell is kept for a long time (3 months or longer), It is strongly recommended that the cell is preserved at dry and low-temperature ($-20\sim-25^{\circ}\text{C}$ $\leq 70\%RH$).

假如电芯要存放 3 个月或更久，强烈建议将电芯保存在干燥、阴凉处 ($\leq 70\%RH$ 、 $-20\sim-25^{\circ}\text{C}$) 。

9.2 Other 其它

Any matters that specifications does not have, should be conferred with between the both parties.

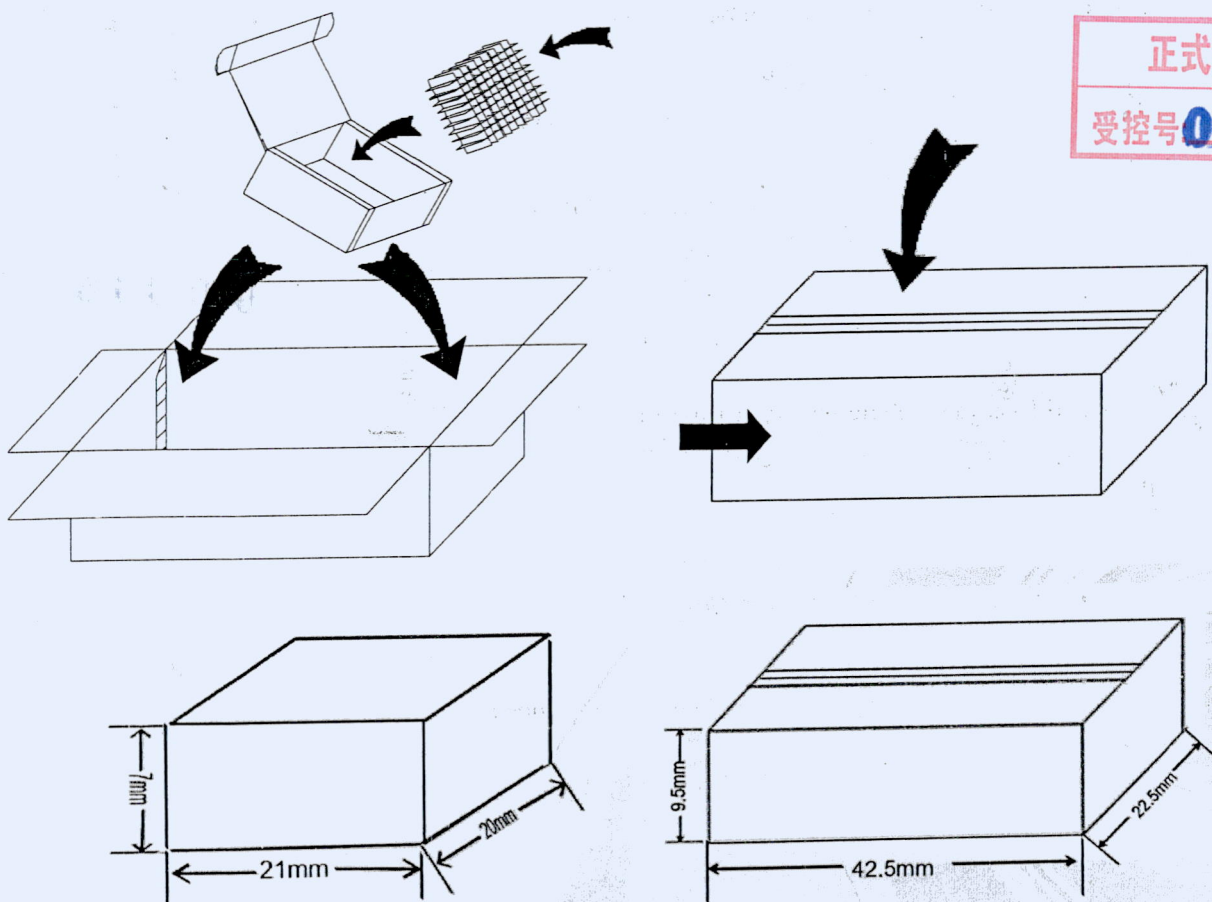
规格书未尽事宜，由双方协商解决。

10、 Package 包装

100 cells per box, 2 boxes into a case, totally 200 cells. Sketch map refers to attached drawing 2. The dimensions are shown in the table below.

电芯包装每盒装 100 只电芯，每箱装 2 盒，共 200 只电芯。包装示意图见附图 2。尺寸见下表。

Attached drawing2 附图2





锂离子电池的处理注意事项和禁止事项

Inaccurate handling of lithium ion and lithium ion polymer rechargeable battery may cause leakage, heat, smoke, an explosion, or fire.

锂离子和锂离子聚合物电池处理不当可能导致泄漏、发热、烟雾、爆炸或火灾。

This could cause deterioration of performance or failure. Please be sure to follow instructions carefully.

这可能会导致性能下降或丧失。请务必仔细按照说明操作。

Safety precaution and prohibitions 安全预防和禁止事项

To assure product safety, describe the following precautions in the instruction manual of the application.

为确保产品安全，请在使用说明书中说明以下注意事项。

[Danger] 危险

Electrical misuse 电滥用

Use dedicated charger.

使用专用充电器。

Use or charge the battery only in the dedicated application.

仅在专用应用程序中使用或充电电池。

Don't charge the battery by an electric outlet directly or a cigarette lighter charger.

不要直接用插座或点烟器充电器给电池充电。

Don't charge the battery reversely.

不要给电池反向充电。

Environmental misuse 环境滥用

Don't leave the battery near the fire or a heated source.

不要把电池放在靠近火源或热源的地方。

Don't throw the battery into the fire.

不要把电池扔进火里。

Don't leave, charge or use the battery in a car or similar place where inside of temperature may be over 60°C.

不要在温度可能超过 60°C 的地方放置、充电或使用电池，如汽车内或类似的地方。

Don't immerse, throw, wet the battery in water / seawater.

请勿将电池浸没、抛掷、浸湿于水/海水中。

Others 其它

Don't fold the battery cased with laminated film such as pouch and Polymer.

不要用薄膜(如聚合物塑料袋)覆盖电芯。

Don't store the battery in a pocket or a bag together with metallic objects such as keys, necklaces, hairpins, coins, or screws.

不要将电池与钥匙、项链、发夹、硬币或螺丝等金属物品一起存放在口袋或袋子里。

Don't short circuit (+) and (-) terminals with metallic object intentionally.

不要故意将电池的正负极端子用金属物体连接。





Don't pierce the battery with a sharp object such as a needle, screw drivers.

不要用针、螺丝刀等锋利的物体刺穿电池。

Don't heat partial area of the battery with heated objects such as soldering iron.

不要用烙铁等加热物体加热电池。

Don't hit with heavy objects such as a hammer, weight.

不要用锤子等重物击打电池。

Don't step on the battery and throw or drop the battery on the hard floor to avoid mechanical shock.

请勿踩在电池上，将电池扔或摔在坚硬的地板上，以免造成机械冲击。

Don't disassemble the battery or modify the battery design including electric circuit.

请勿拆卸电池或修改电池设计，包括电路。

Don't solder on the battery directly.

不要直接在电池上焊接。

Don't use seriously scared or deformed battery.

不要使用严重损坏或变形的电池。

Don't put the battery into a microwave oven, dryer, or high-pressure container.

不要将电池放入微波炉、烘干机或高压容器中。

Don't use or assemble the battery with other makers' batteries, different types and/or models of batteries such as dry batteries, nickel-metal hydride batteries, or nickel-cadmium batteries.

请勿将电池与其他制造商的电池、不同类型和/或型号的电池(如干电池、镍氢电池或镍镉电池)一起使用或组装。

Don't use or assemble old and new batteries together.

不要混合使用或组装新旧电池。

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受控号 00013

[Warning] 警告

Stop charging the battery if charging isn't completed within the specified time.

如果在规定时间内没有完成充电，请停止充电。

Stop using the battery if the battery becomes abnormally hot, order, discoloration, deformation, or abnormal conditions is detected during use, charge, or storage.

如果在使用、充电或储存过程中发现电池出现异常发热、变色、变形或异常情况，请停止使用电池。

Keep away from fire immediately when leakage or foul odors are detected. If liquid leaks onto your skin or cloths, wash well with fresh water immediately.

如发现泄漏或异味，应立即远离火源。如果液体泄漏到皮肤或衣物上，立即用清水冲洗干净。

If liquid leaking from the battery gets into your eyes, don't rub your eyes and wash them with clean water and go to see a doctor immediately.

如果电池漏液进入眼睛，不要揉搓眼睛，应用清水洗净并立即前往医院治疗。

If the terminals of the battery become dirty, wipe with a dry cloth before using the battery.

如果电池的正负极端子变脏，使用前用干布擦拭。



Cover terminals with proper insulating tape before disposal.

处理电池前应先使用合适的绝缘胶带覆盖正负极端子。

[Caution!] 谨慎操作

Electrical misuse 电滥用

Battery must be charge with constant current-constant voltage (CC/CV).

电池必须使用恒流恒压充电。

Charge current must be controlled by specified value in Cell specification.

充电电流必须控制在电芯规格书中指定的值以内。

Cut-off Voltage of charging must be 4.20V

充电截止电压不得超过 4.20V。

Charger must stop charging battery by detecting either charging time or current specified in Cell's specification.

当达到电芯规格中指定的充电时间或电流时，充电器必须停止充电。

Discharge current must be controlled by specified value in Cell's specification.

放电电流必须控制在电芯规格书中指定的值以内。

Cut-off Voltage of discharging must be over 2.75V.

放电截止电压不得小于 2.75V。

Others 其它

Keep the battery away from babies and children to avoid any accidents such as swallow.

电池远离婴幼儿，避免发生吞咽等意外。

If younger children use the battery, their guardians should explain the proper handling method and precaution before using.

如儿童使用电池，其监护人应在使用前说明正确使用方法及注意事项。

Before using the battery, be sure to read the user's manual and precaution of it's handling.

在使用电池前，请务必阅读使用说明书及注意事项。

Before using charger, be sure to read the user's manual of the charger.

在使用充电器前，请务必阅读充电器使用说明书。

Before installing and removing the battery from application, be sure to read user's manual of the application.

在从应用中安装和拆卸电池之前，请务必阅读应用的使用说明书。

Replace the battery when using time of battery becomes much shorter than usual.

当电池的使用时间比以往短很多时，请及时更换电池。

Cover terminals with insulating tape before proper disposal.

在处理电池前先用绝缘胶带覆盖电池的正负极端子。

If the battery is needed to be stored for an long period, battery should be removed from the application and stored in a place where humidity and temperature are low.

如果电池需要储存较长一段时间，应先将电池从应用中拆卸出，并存放于阴凉干燥处。

正式受控文件

受控号 0015



While the battery is charged, used and stored, keep it away from object materials with static electric chargers.

电池在充电、使用和储存过程中，应远离会产生静电的物体。

Safety handling procedure for the transporter

运输安全操作规程

Quarantine 检疫

Packages that are crushed, punctured or torn open to reveal contents should not be transported. Such packages should be isolated until the shipper has been consulted, provided instructions and, if appropriate, arranged to have the product inspected and repacked.

包装被压坏、刺破或撕开查看的，不得运输。在咨询发货人提供指示并在适当情况下安排对产品进行检查和重新包装之前，此类包装应予以隔离。

Spilled Product 漏液产品

In the event that damage to packaging results in the release of cells or batteries, the spilled products should be promptly collected and segregated and the shipper should be contacted for instructions.

如果包装破损导致电芯或电池漏液的，应及时收集和隔离漏液的产品，并与发货人联系以获得指示。

Design of positioning the battery pack in application and charger

电池组在应用和充电保护设计

To prevent the deterioration of the battery performance caused by heat, battery shall be positioned away from the area where heat is generated in the application and the charger.

为防止高温对电池性能的影响，电池在应用和充电过程中应远离产生热量的区域。

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