SHENZHEN HONGLI POWER BATTERY CO LTD.
深圳市宏力动力电池有限公司

锂离子电芯规格书

Specification

For

Lithium-ion Rechargeable Cell

电芯型号 **: H18650CQ**

Cell Type : H18650CQ

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Approved	**Checked**	**Designed**	
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Contents 目 录

1 Preface 前 言

This specification describes the type, dimension, performance, technical characteristics, warnings and cautions of the lithium-ion rechargeable cell. The specification only applies to H18650CQ fresh cells supplied by Shenzhen HONGLI Power Battery Co., Ltd and Zhengzhou HONGLI Battery Co., Ltd.

本标准描述了圆柱型锂离子电芯的型号、尺寸、特性、技术要求及注意事项。本标准仅适用于深圳市比克动力电池有限公司及郑州比克电池有限公司生产的新鲜的圆柱型H18650CQ 锂离子电芯。

2 Definition 定 义

2.1 Standard charge method 标准充电方式

At 25 ± 2 °C, the cell is charged to 4.2 V under 0.5 C (1275 mA) constant current, then charged under 4.2 V constant voltage until the current tapers to 0.01C (26 mA).

在25 ±2 °C 下，电芯以0.5 C（1275 mA）恒流充电至4.2 V 后，以4.2 V 恒压充电至0.01 C（26 mA）。

2.2 Standard discharge method 标准放电方式

At 25 ± 2 °C, the cell is discharged to 2.75 V under 0.2 C (510 mA) constant current.
在 25 ± 2 °C 下，电芯以 0.2 C（510 mA）恒流放电至 2.75 V。

2.3 Rate discharge method 倍率放电方式

At 25 ± 2 °C, the cell is discharged to 2.75 V under 1 C (2550 mA) constant current.
在 25 ± 2 °C 下，电芯以 1C（2550 mA）恒流放电至 2.75 V。

2.4 Nominal capacity 标称容量

The cell nominal capacity, signed as Cap and using mAh as unit, is obtained as per standard charge followed by standard discharge.

电芯标称容量以Cap 表示，单位为毫安时（mAh），是指电芯按标准充电方式充电后，按标准放电方式放电得到的容量。

3 Cell type and dimension电芯型号及尺寸

3.1 Description and model 电芯说明及型号

Description: Cylindrical Li-ion rechargeable cell
说明：圆柱型锂离子可再充电电芯
Type: H18650CQ
型号：H18650CQ

3.2 Cell dimension 电芯尺寸

Cell physical dimension listed in Figure 1(unit: mm).
电芯尺寸示意图如图1 所示（单位：mm）。

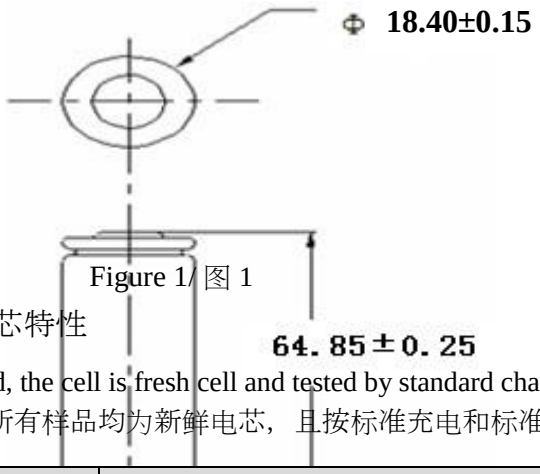

Figure 1/ 图 1

4 Cell characteristics电芯特性

Unless otherwise specified, the cell is fresh cell and tested by standard charge and standard discharge.
除非有特殊说明，否则所有样品均为新鲜电芯，且按标准充电和标准放电方式进行测试。

ITEM 项目		SPECIFICATION 规格
Capacity 容量	Nominal capacity 标称容量	2550 mAh @ 0.2 C By Standard Charge/Discharge Method
	MInimum capacity 最小容量	2500 mAh @ 0.2 C By Standard Charge/Discharge Method
Nominal voltage 标称电压		3.60 V
Charge voltage 充电电压		4.20V±0.05V（＞4.2V 时不保证循环）
Discharge cut-off voltage 放电终止电压		2.75 V
Energy density 能量密度		207 Wh/Kg (0.2 C)
Max charge current 最大充电电流		For cycle life: 0.5C（1275mA） 45℃＞T≥25℃ 0.33C（840mA） 25℃＞T≥10℃

	0.15C（382mA） 10℃＞T≥5℃ 0.1C（255mA） 5℃＞T≥0℃ Not for cycle life: 1C（2550mA） 45℃＞T≥25℃
Max discharge current 最大放电电流	For cycle life: 0.5C（1275mA） -10℃＞T≥-20℃ 1C （2550mA） 60℃＞T≥-10℃ Not for cycle life: 4C （10200mA） 40℃＞T≥20℃ 3C （7650mA） 20℃＞T≥10℃ 2C （5100mA） 10℃＞T≥-10℃,50℃＞T≥40℃ 1C （2550mA） -10℃＞T≥-20℃
Humidity range 湿度范围	0 ~ 60% RH (non-condensing 不冷凝)
Internal resistance 内阻	≤ 30 mΩ (AC Impedance, 1000 Hz)
Cell dimension 电芯尺寸	Height: 64.85±0.25 mm 高度：64.85±0.25 mm Diameter: 18.4±0.15 mm 直径：18.40±0.15 mm
Weight 重量	≤ 48 g

5 Technical requirements技术要求

5.1 Cell usage conditions 电芯使用环境

Charge temperature 充电温度： 0 ~ 45 °C

Temperature of discharge（Cell surface limit temperature）放电温度（电芯表面极限温度）： -20～65℃

5.2 Cell testing conditions 电芯实验环境

Unless otherwise specified, all tests stated should be done at 25 ± 2 °C.
除非有特殊说明，所有测试须在25 ± 2 °C下完成。

5.3 Requirement of the testing equipment 测量仪表要求

The voltage measurement device: not less than 0.5 grade
电压测量装置：不低于 0.5 级
The current measurement device: not less than 0.5 grade
电流测量装置：不低于 0.5 级
AC Impedance: 1000 Hz
交流阻抗测量频率：1000 Hz
Temperature meter: precision ≤ 0.5 °C

温度仪表要求：精度为≤0.5 °C

Time measurement tolerance: ± 0.1%

时间测量公差：±0.1%

The size measurement tolerance: ± 0.1%

尺寸测量公差：± 0.1%

The quality measurement tolerance: ± 0.1%

质量测量公差：± 0.1%

5.4 Electrochemical Characteristics 电化学特性

Unless otherwise specified, the cell should be fresh cell and tested by standard charge and standard discharge.
除非有特殊说明，否则所有样品均为新鲜电芯，且按标准充电和标准放电方式进行测试。

No. 序号	**Item** 测试项目	**Test method and conditions** 测试方法与条件	**Criterion** 性能标准
5.4.1	Rate discharge capability 倍率放电性能	Standard charge followed by constant current discharge to 2.75 V at specified discharge rates at 25 ± 2 °C 按标准充电方式充电后，在 25 ± 2 °C 下以给定放电倍率恒流放电至 2.75V。	$\frac{\text{discharge capacityat 0.5C}}{\text{discharge capacityat0.2C}} \geq 96\%$; $\frac{\text{0.5C放电容量}}{\text{0.2C放电容量}} \geq 96\%$; $\frac{\text{discharge capacityat 1.0C}}{\text{discharge capacityat0.2C}} \geq 94\%$; $\frac{\text{1.0C放电容量}}{\text{0.2C放电容量}} \geq 94\%$; $\frac{\text{discharge capacityat 2.0C}}{\text{discharge capacityat0.2C}} \geq 94\%$; $\frac{\text{2.0C放电容量}}{\text{0.2C放电容量}} \geq 94\%$ $\frac{\text{discharge capacity at 3.0C}}{\text{discharge capacity at 0.2C}} \geq 95\%$; $\frac{\text{3.0C放电容量}}{\text{0.2C放电容量}} \geq 95\%$

			discharge capacity at 4.0C / discharge capacity at 0.2C ≥ 95% ; 4.0C放电容量 / 0.2C放电容量 ≥ 95%
5.4.2	RT cycle life 常温循环寿命	Temperature : 25±2 ℃ Charge: Standard charge method Discharge: Rate discharge method For 1000 cycles. 1001th: Charge: Standard charge method Discharge: standard discharge method 25±2℃下，标准充电和倍率放电制式，循环 1000 次 第1001 次：标准充电和标准放电分容	Discharge capacity of 1001th cycle / minimum capacity ≥80% 第1001次循环的放电容量 / 标称最小容量 ≥80%
	45℃cycle life 45℃循环寿命	Temperature :45±2 ℃ Charge: Standard charge method Discharge: Rate discharge method For 1000 cycles. 1001th: Charge: Standard charge method Discharge: standard discharge method 45±2℃下，标准充电和倍率放电制式，循环 1000 次 第1001 次：标准充电和标准放电分容	Discharge capacity of 1001th cycle / Original discharge capacity ≥75% 第1001次循环的放电容量 / 初始放电容量 ≥75%
5.4.3	High-low temperature discharge performance 高低温放电性能	Standard charge followed by 1 C (2550 mA) constant current discharge to 2.75 V at specified temperature. Discharge cut-off voltage shall be 2.5 V when	discharge capacity at - 20^{O} C / discharge capacity at 25^{O} C ≥ 70% ; - 20^{O} C 放电容量 / 25^{O} C放电容量 ≥ 70%

		discharge temperature below -10 °C. 按标准充电方式充电后，在指 定温度下以 1 C（2550 mA）电流恒流放电至截止电压 2.75 V。当放电温度低于-10 °C 时，放电截止电压为 2.5 V。	$\frac{\text{discharge capacity at -10 }^{O}\text{ C}}{\text{discharge capacity at 25}^{O}\text{ C}} \geq 75\%$; $\frac{-10\ ^{O}\text{ C 放电容量}}{25^{O}\text{ C放电容量}} \geq 75\%$; $\frac{\text{discharge capacity at 0}^{O}\text{ C}}{\text{discharge capacity at 25}^{O}\text{ C}} \geq 85\%$; $\frac{0^{O}\text{ C 放电容量}}{25^{O}\text{ C放电容量}} \geq 85\%$ $\frac{\text{discharge capacity at 45}^{O}\text{ C}}{\text{discharge capacity at 25}^{O}\text{ C}} \geq 100\%$ $\frac{45^{O}\text{ C 放电容量}}{25^{O}\text{ C放电容量}} \geq 100\%$ $\frac{\text{discharge capacity at 60 }^{O}\text{ C}}{\text{discharge capacity at 25}^{O}\text{ C}} \geq 100\%$; $\frac{60^{O}\text{ C 放电容量}}{25^{O}\text{ C放电容量}} \geq 100\%$
5.4.4	Storage performance at 25 °C (100% SOC) 25 °C 满电存储性能	(1) Standard charge 标准充电方式充电 (2) Stored at 25 °C for 28 days 于 25 °C 下存储 28 天 (3) Standard discharge 标准放电方式放电	$\frac{\text{Residual capacity after 28days storage}}{\text{Original discharge capacity}} \geq 95\%$ $\frac{\text{存储28天残余容量}}{\text{初始容量}} \geq 95\%$ $\frac{\text{Recovery capacity after 28days storage}}{\text{Original discharge capacity}} \geq 97\%$ $\frac{\text{存储28天恢复容量}}{\text{初始容量}} \geq 97\%$
5.4.5	High temperature storage performance (100% SOC)	(1) Standard charge 标准充电方式充电 (2) Stored at 60 °C for 7 days 于 60 °C 下存储 7 天 (3) Kept at 25 °C for 5 hours	$\frac{\text{Residual capacity after 7days storage}}{\text{Original discharge capacity}} \geq 95\%$

	高温满电存储性能	于 25 °C 搁置 5 小时 (4) Standard discharge 标准放电方式放电	存储7天残余容量 / 初始容量 ≥95% Recovery capacity after 7days storage / Original discharge capacity ≥97% 存储7天恢复容量 / 初始容量 ≥97%
5.4.6	Storage performance at 45 °C (50% SOC) 45 °C 半电存储性能	(1) Standard charge 标准充电方式充电 (2) 1 C constant current discharge for 30 minutes 以 1 C 恒流放电 30 分钟 (3) Stored at 45 °C for 28 days 于 45 °C 下存储 28 天 (4) Kept at 25 °C for 5 hours 于 25 °C 搁置 5 小时 (5) Standard charge 标准充电方式充电 (6) Standard discharge 标准放电方式放电	Recovery capacity after 28days storage / Original discharge capacity ≥95% 存储28天恢复容量 / 初始容量 ≥95%

5.5 Environmental characteristics and safety characteristics 环境适应性能和安全性能

No. 序号	Item 测试项目	Testing method 测试条件与方法	Criterion 性能标准
5.5.1	Overcharge test 过充测试	After fully charged according to the standard charge method, the cell is charged at 1 C till the ending conditions: the cell voltage reaches 1.5 times of the cut-off voltage of standard charge or the 1 C charge time reaches 60 min. The cell is observed for 60 min afterwards. 电芯以标准充电方式充满电，然后以 1 C 充电至电压达到充电终止电压的 1.5 倍或充电时间达 60 min 后停止充电，观察 60 min。	No fire, no explosion 电芯不起火、不爆炸

5.5.2	130 ℃ hot oven test 130 ℃热箱测试	After fully charged according to the standard charge method, the cell is put in a oven at a heating speed of 5 ℃per minute until the temperatures of both the cell and the oven reach 130 ℃. The cell shall be maintained at 130 ℃for 30 min or until a fire or explosion is obtained. 电芯按照标准充电方式充满电后，将电芯放进热箱里，然后将热箱按5 ℃/min 升温到130 ℃，当电芯的温度也达到130 ℃时，电芯在热箱130 ℃环境下保持30 min 或者电芯起火爆炸为止。	No fire, no explosion 电芯不起火、不爆炸
5.5.3	Crush test 挤压测试	After standard charge, cell is crushed between two flat surfaces until an applied force of 13kN±1kN is reached. 标准充电后，将电芯放在两个平板内进行挤压，当压力达到13kN±1kN时结束测试。	No fire, no explosion 电芯不起火、不爆炸
5.5.4	Short circuit test 短路测试	After fully charged according to the standard charge method, the cell is short-circuited by connecting the positive and negative terminals with a copper wire for 10 min. The wire resistance shall be less than 5 mΩ. The cell is observed for 1 h after test. 以标准充电方式充满电后，用内阻小于5 mΩ的电线将电芯正、负极外部短路10 min，观察1 h。	No fire, no explosion 电芯不起火、不爆炸
5.5.5	Over discharge test 过放测试	After fully charged according to the standard charge method, the cell is discharged at 1 C for 90 min and then observed for 1 h. 电芯按标准充电后以1 C 电流放电90 min，观察1 h。	No fire, no explosion, no leak 电芯不起火、不爆炸、不漏液
5.5.6	Drop test 跌落测试	After fully charged according to the standard charge method, the cell is dropped with both ends from a height of 1.5 m onto the cement floor. Afterwards, the cell is observed for 1 h. 电芯按标准充电后分别以正负端子两个方向从1.5 m 高度处自由跌落到水泥地面上。	No fire, no explosion, no leak 电芯不起火、不爆炸、不漏液
5.5.7	Seawater immersion 海水浸泡	After fully charged according to the standard charge method, the cell is immersed in sea water (3.5wt% of NaCl) for 2 h. Afterwards, the cell is observed for 1 h. 电芯按标准充电后完全浸入3.5% NaCl 溶液（质量百分比，模拟常温下的海水成分）中2 h，并观察1 h。	No fire, no explosion, no leak 电芯不起火、不爆炸
5.5.8	Thermal cycling 温度循环	After fully charged according to the standard charge method, the cell is put in an oven. Then set the oven temperature as follows: (1) Decrease the chamber temperature from RT to -40 ℃ within 60 min and keep the cell under -40 ℃ for 90 min; (2) Raise the chamber temperature from -40 ℃ to 25 ℃ within 60 min; (3) Raise the chamber temperature from 25 ℃ to 85 ℃ within 90 min and keep the cell under 85 ℃ for 110 min;	No fire, no explosion, no leak 电芯不起火、不爆炸、不漏液

		(4) Decrease the chamber temperature from 85 ℃ to 25 ℃ within 70 min; (5) Repeat the sequence for a further 4 cycles. Afterwards, the cell is observed for 1 h. 电芯按标准充电方式充电后放入温度箱中，然后按以下步骤调节温度箱温度： ⑴ 在60 min 内由25 ℃降温至-40 ℃，保持90 min； ⑵ 在60 min 内温度升至25 ℃； ⑶ 在90 min 内温度升至85 ℃，保持110 min； ⑷ 在70 min 内降温至25 ℃； ⑸ 循环以上步骤4 次。 结束后观察1 h。	
5.5.9	Low pressure 低气压	After fully charged according to the standard charge method, the cell is put at the pressure of 11.6 kPa for 6 h. Afterwards, the cell is observed for 1 h. 电芯以标准充电方式充满电后将其放入低气压箱中，调节试验箱中气压为 11.6 kPa，温度为室温，静置 6 h，之后观察 1 h。	No fire, no explosion, no leak 电芯不起火、不爆炸、不漏液
Note 备注	Unless otherwise specified, all safety tests above shall be conducted in ventilated environment at 25 ± 2 ℃ and under protective equipment. 除特殊说明，以上所有安全测试均应在 25 ± 2 ℃通风橱中，且附带有保护装置的条件下进行。		

6 Package picture 包装图片



Small box **big box** **pallet**

(100pcs cells in a small box, 2 small boxes in a big box)

7 Shipment 出 货

The cell shall be shipped in voltage range of 3.6 ~ 3.9 V or in accordance with customers' requirement. The remaining capacity before charging shall be changed depending on the storage time and conditions.

单体电芯按 3.6 ~ 3.9 V 的充电电压或客户要求出货，电芯出货后充电前的剩余容量取决于储存时间和条件。

8 Warranty 质量保证

The cell warranty period is made according to business contract. HONGLI Power will replace no cells for free after shipment if there are problems due to customers' abuse or misuse instead of HONGLI Power's manufacturing failure.

电芯的保质期限依合同而定，交货之后，如非深圳市比克动力电池有限公司的制程原因，而是客户的滥用和误用造成的电芯质量问题，深圳市比克动力电池有限公司不承诺免费更换。

HONGLI Power will not be responsible for the trouble caused by handling in violation of cautions in instructions. 深圳市比克动力电池有限公司对违反安全守则操作所产生的问题不承担任何责任。

HONGLI Power will not be responsible for the trouble caused by matching electric circuit, cell pack and charger. 深圳市比克动力电池有限公司对与电路、电池组和充电器搭配使用所产生的问题不承担任何责任。HONGLI Power will not be responsible for any defect of cells caused during assembling after acceptance.

出货后客户在电芯组装过程中产生的不良电芯不在深圳市比克动力电池有限公司质量保证的范围之列。

9 Storage and shipment requirement 存储及运输要求

Item 项目		Permissible time 可存储时间
Storage environment 储存环境	45 °C ~ 60 °C, 60% RH Max	Less than 1 month 少于 1 个月
	25 °C ~ 45 °C, 60% RH Max	Less than 3 months 少于 3 个月
	-20 °C ~ 25 °C, 60% RH Max	Less than 1 year 少于 1 年
About long time storage: If the cell needs to be stored for a long time, the cell's storage voltage should be 3.6 ~ 3.9 V. Also, it is recommended to charge the cell every six months. 关于长期存储： 若电芯需长期存储，电芯的存储电压应该为 3.6 ~ 3.9 V。同时，建议每 6 个月对电芯进行充电。		

10 Warning and cautions in handling the lithium-ion cell 电芯使用时警告事项及注意事项

Battery abuse can cause damage to the cell and/or personal injury. Please read and observe the standard cell precautions below before utilization.

电池滥用可能会造成对电芯的损害或对人身的伤害，在使用前，请仔细阅读以下安全守则。

Note 1, the customer is required to contact Shenzhen HONGLI Power Battery Co., Ltd. in advance, if and when the customer needs other applications or operating conditions not described in this specification.

注释1，客户如需在本规格书所述之外的条件下使用电芯，请提前联系深圳市比克动力电池有限公司。

Note 2, Shenzhen HONGLI Power Battery Co., Ltd. will take no responsibility for any accident when the cell is used under other conditions not described in this specification.

注释 2，如在本规格书所述条件之外使用电芯而发生事故，深圳市比克动力电池有限公司不承担任何责任.

Warnings 警 告

To prevent damage or injury from battery leaking, heating and/or explosion, please observe the following precautions before use. (It should be indicated especially in manual or instruction for users.)

为避免因电池泄漏、发热和/或爆炸造成伤害，请在使用前注意以下预防措施。（应在使用说明手册或说明书中特别注明）

1	Do not use and leave the cell near a heat source such as fire or heater.
	禁止在火、加热器待高温热源附近使用和留置电芯。
2	Do not use or leave the battery at very high temperature conditions (e.g., strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it can overheat or catch fire or its performance will be degenerate and its service life will be decreased.
	禁止在高温下（直热的阳光下或很热的汽车中）使用或留置电池，否则可能会引起电池过热、起火、功能失效和寿命减短。
3	Do not short circuit, over-charge or over-discharge the cell.
	不要将电芯短路、过充或过放。
4	Don’t immerse the battery in water and seawater. Please put it in cool and dry environment if no using.
	严禁将电池浸入海水或水中，保存不用时，应放置在阴凉干燥的环境中。
5	Don’t reverse the positive and negative terminals
	严禁颠倒正负极使用电池。
6	Do not disassemble or modify the cell.
	不要拆卸或修整电芯。
7	Do not transport or store the battery together with metal objects such as necklaces, hairpins, coins, etc.
	禁止将电池与金属，如发夹、项链等一起运输或贮存。
8	Make sure the cell is not with conspicuous damage or deformation.
	不要使电芯受到明显的损害或变形。
9	Don’t connect the cell to an electrical outlet directly.
	严禁将电芯直接插入电源插座。
10	If the cell leaks and the electrolyte splashes into the eyes, rinse the eyes with clean running water immediately for at least 15 minutes, and go to hospital for treatment if necessary.
	如果电芯发生泄露，电解液进入眼睛，请立即用流动的清水冲洗眼睛至少 15 min，必要时请立即前往医院接受治疗。

11	Mixed use of batteries of different types is not allowed.
	禁止与液态锂离子或不同型号的锂电池混合使用。
12	Keep the battery away from babies.
	避免让小孩接触电池。
13	Do not directly solder the battery and pierce the battery with a nail or other sharp objects.
	禁止直接焊接电池和用钉子或其它利器刺穿电池。
14	Do not strike, throw or trample the battery.
	禁止敲击、抛掷或踩踏电池等。
15	Use the battery charger specifically for that purpose when charging.
	请选用锂离子电池专用充电器进行充电。
16	Please separate cells of different electrochemical systems from one another when disposing of secondary cells.
	二次电池处理时，请将电池和其他电化学体系的产品分开。
17	Clean the terminals with a dry cloth before use if the battery terminals are dirty. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.
	如果电池弄脏，使用前应用干布抹净，否则可能会导致接触不良功能失效。
18	Batteries should be removed from the device or charger immediately and not used again if they are over heat, give off odor, discolor or deform, or appear abnormally in any way during use, charging and storage.
	如果电池发出异味、发热、变色、变形，或在使用、贮存和充电过程中出现任何异常现象，立即将电池从装置或充电器中移离并停用。
19	The battery replacement shall be done only by either cell supplier or device supplier instead of the user.
	更换电芯应由电芯供应商或设备供应商完成，用户不得自行更换。
20	Please tape the terminals to insulate batteries before discarding them in case of fire and explosion.
	废弃电池之前应用绝缘纸包住电极，以防起火、爆炸。
21	Do not use cells in strong electrostatic and magnetic occasions, otherwise, it can cause safety problems easily.
	禁止在强静电和强磁场的地方使用，否则易带来不安全的隐患。
22	Use of damaged cells is not permitted.
	禁止使用已损坏的电芯。
23	Make sure package designing will not cause battery damages.
	电池外壳设计和包装禁止损伤电池。
24	Battery packing should be conducted strictly according to level range, any misuse of different levels should not be permitted.
	电池配组时需严格按等级执行，不能跨等级成组。
25	Disassembling cells from pack or module is not permitted unless under the guidance of professional technicians.
	严禁将电池从电池包或电池模组中拆卸，除非在专业技术人员的指导下进行。

11 The restriction of the use of hazardous substances 有害物质控制要求

This model of lithium-ion cell is in accordance with our company's request of

"The hazardous substances and material management standard" or customer's requirements.

本型号锂离子电芯符合本公司《有害物质与材料管理规范》要求或参照客户要求执行。

12 Contact information 联系方式

If you have any questions regarding the cell, please contact the following address:

如有疑问，请按以下地址联系：

Headquarter: HONGLI Industrial Park on Kuichong Street, Dapeng District, Shenzhen (518119)

厂址：深圳大鹏新区葵涌街道比克工业园（518119）

Tel: +86-755-61886818-6939（王工） Fax: +86-755-84208691

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13 Version change record 修订履历

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