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SPECIFICATIONS

RECHARGEABLE LITHIUM-ION BATTERY CELL

规格书

锂离子二次充电电池粒

Product Code (产品型号): INR18650A260 A
Nominal Capacity (标称容量): 2600 mAh

Version: 版本: A-1	File No.: 文件编号:	INR18650A260 A (2019-04-25)	
Revised on: (修订日期)	Prepared by: (拟定)	Checked by: (审核)	Approved by: (批准)
2019-4-24	龙霞	樊育良	董超祺

* Customer Agreement 客户协议:

Customer Name 客户名称: 客户

Signature 签名:

Name (in print) 姓名(正楷):

Issue Date 发送日期: 2019-04-25

Sign Back Date 回签日期:

* Original and copies of this Product Specifications Document,
including signed and/or not returned, bear the same legal status and effect.

* 本产品规格书的原件和其它副本, 含已签名及/或未退回的, 均具有相同的法律地位和效力。

* If there is no reply within 30 days following delivery,
this Product Specifications Document would be regarded as valid and accepted by customer.

* 如果在交付后30天内没有回复，则代表客户已接受本产品规格书为有效的。

CUSTOMER'S COPY

RECHARGEABLE LITHIUM-ION BATTERY CELL (锂离子二次充电电池粒)

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1. Preface
前言

1.1 This Product Specifications Document (thereafter called the "PS-Document") describes the technical specifications, test procedures and notes of prohibitions and cautions in handling individual INR18650A260 A Rechargeable Lithium-ion Battery Cell (thereafter called the "Battery Cell" or "Battery Cells") to be supplied to customers of the Changde YikLik Energy Limited (thereafter called the "YLE").

本产品规格书 (以下简称 “PS-Document”) 所描述的技术规格、测试程序和关于产品禁止和注意事项以及安全使用的说明， 都是针对由常德毅力能源有限公司 (以下简称 “YLE”) 将为其客户提供的 INR18650A260 A 的单粒锂离子二次充电电池粒 (以下简称 “锂电池粒”) 而编写的.

1.2 Before putting Battery Cells into application(s), please read this PS-Document carefully and make sure you fully understand all the contents contained therein; and keep this PS-Document for future reference.

把锂电池粒应用在生产电池组之前，请仔细阅读本规格书，并确保你完全明白全部所述内容; 也请将此规格书 妥善保存 以便日后 参考.

2. Application
应用范围

Terms and Conditions contained in this PS-Document are applicable to individual INR18650A260 A Rechargeable Lithium-ion Battery Cell, which is custom-designed for the production of general products by Customers.

本规格书所包含的条款和条件适用于为 客户 用作生产 一般产品 而专门设计的 INR18650A260 A 锂电池粒.

3. Description
产品描述

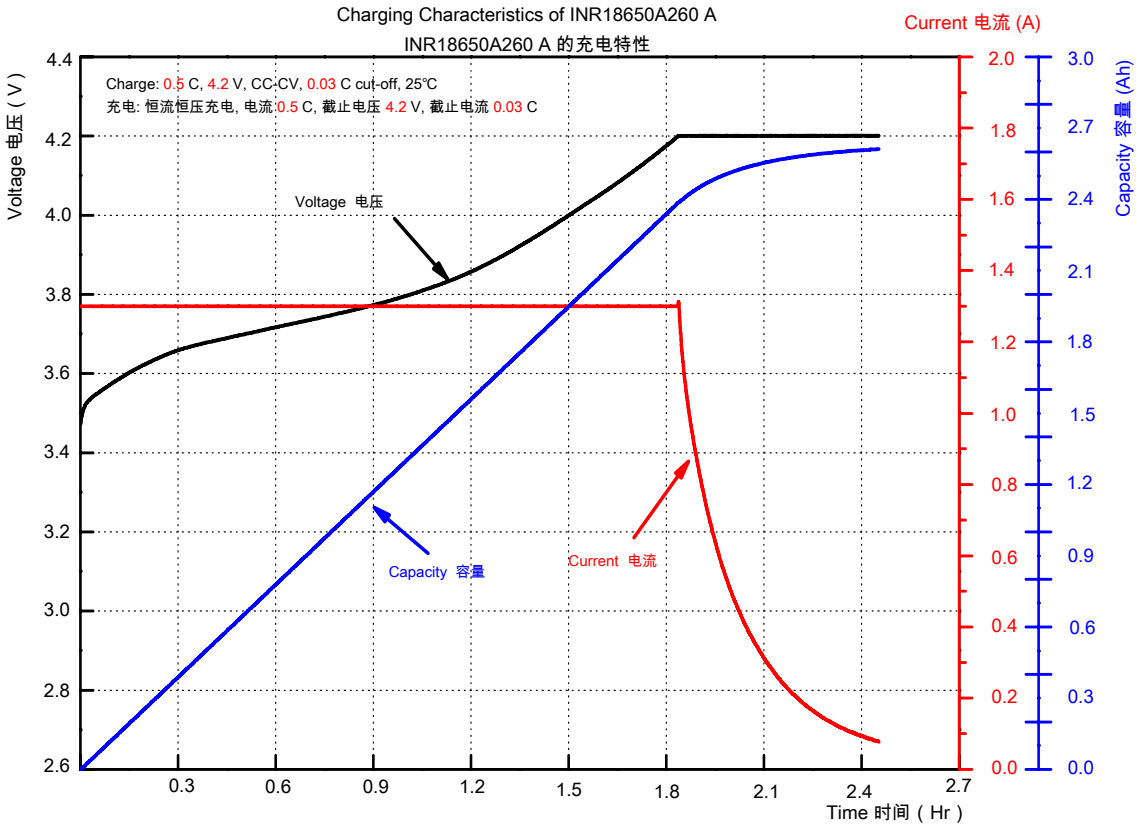
3.1	Description: 类型:	Rechargeable Lithium-ion Battery Cell (thereafter called the "Battery Cell" or "Battery Cells") 锂离子二次充电电池粒 (以下简称为 “锂电池粒”)
3.2	Battery Cell Model: 锂电池粒型号:	INR18650A260 A INR18650A260 A
	Notes for model no.: 型号代码说明:	INR * 18 * 650 * D * 260 = LiNMC Cylindrical * Diameter * Height * Cap Kind * Capacity INR * 18 * 650 * D * 260 = LiNMC 圆柱型 * 外径 * 高度 * 盖帽类型 * 标称容量

4. Specifications
规格参数

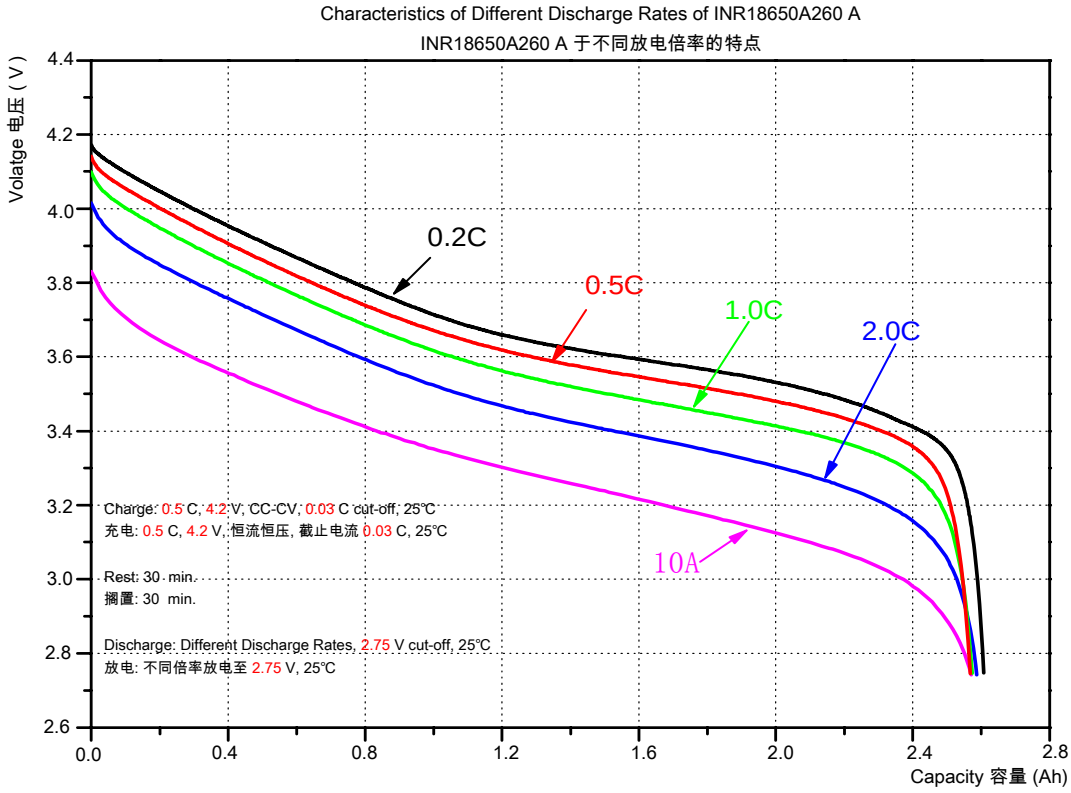
4.1	Typical Capacity 标称容量	2600 mAh	Standard Discharging after Standard Charging. 标准充电后标准放电.
4.2	Minimum Capacity 最小容量	2550 mAh	
4.3	Nominal Voltage 标称电压	3.6 V	
4.4	Internal Impedance 内阻	≤ 48 mΩ	
4.5	Energy 能量	≤ 9.36 Wh	
4.6	Charging Method 充电方式	Constant current-constant voltage 恒流恒压充电	
4.7	Standard Charging 标准充电	4.2 V, 520 mA , 78 mA (0.03 C) cut-off, 25℃ 限压 4.2 V, 恒流 520 mA , 截止电流 78 mA (0.03 C), 环境温度 25℃	
4.8	Quick Charging 快速充电	4.2 V, 2600 mA (1 C), 26 mA (0.01 C) cut-off, 25℃ 限压 4.2 V, 恒流 2600 mA (1 C), 截止电流 26 mA (0.01 C), 环境温度 25℃	
4.9	Charging Voltage 充电电压	4.2 V±0.03 V	
4.10	Standard Discharging 标准放电	520 mA (constant current, 2.75 V cut-off, 25℃) 限压 2.75 V (恒流 520 mA , 环境温度 25℃)	
4.11	Continuous Discharging 持续放电	5 A (Ambient temperature 25℃)	
4.12	Discharge Cut-off Voltage 放电截止电压	2.75 V	
4.13	Battery Cell Weight 锂电池粒重量	≤ 47 g	
4.14	Battery Cell Dimensions 锂电池粒尺寸	Height with jacket 高度 (连套膜) Diameter with jacket 外径 (连套膜)	65 +0.2/-0.3 mm 18.4 +0.0/-0.3 mm
4.15	Operating Temperature (Ambient) 电芯使用温度范围	Charge: 0 ~ +45℃ Discharge: -20 ~ +60℃	充电: 0 ~ +45℃ 放电: -20 ~ +60℃
4.16	Storage Temperature 电芯贮存温度范围	1 year: -20 ~ +25℃ 3 months: -20 ~ +40℃ 1 month: -20 ~ +50℃	1 年: -20 ~ +25℃ 3 个月: -20 ~ +40℃ 1 个月: -20 ~ +50℃
4.17	Shelf Life 贮存寿命	One (1) year from the date of shipment. 自发货之日算起一 (1) 年以内.	

5. Performance
性能

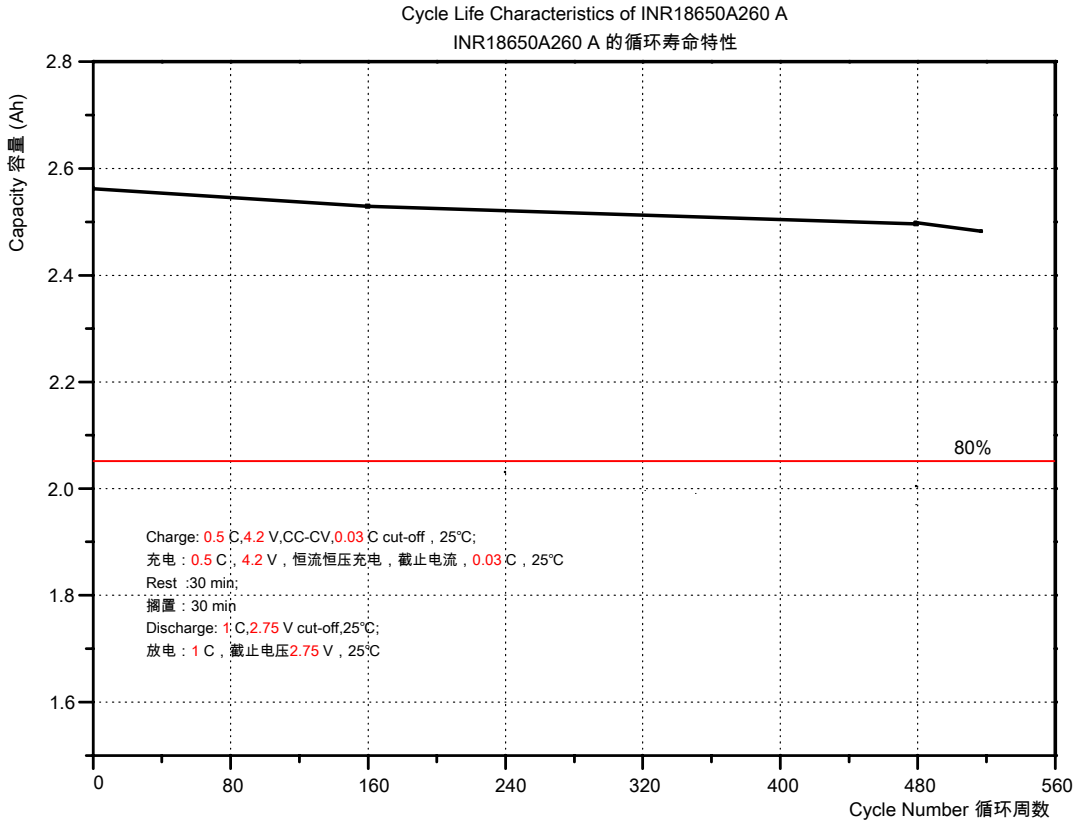
5.1 Characteristics: Charging
充电特征曲线



5.2 Characteristics: Different Discharge Rates
不同倍率放电特征曲线



5.3 Characteristics: Cycle Life
循环寿命特征曲线



6. Appearance
外观要求

There shall be no defects such as scratch, flaw, crack, rust, discoloration, leakage, which may adversely affect the commercial value of the Battery Cells.
锂电池粒的表面不可有诸如刮伤、裂缝、裂纹、生锈、脏污、泄露等现象，以免影响其商品价值.

7. Standard Environmental Conditions of Test
标准环境条件下的锂电池粒性能测试

Unless otherwise specified, all the tests stated in this PS-Document were conducted at ambient temperature of 20±5℃ and relative humidity (RH) 65±20%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature range of 15℃ ~ 30℃ and the range of 25% ~ 85% RH.
除非特别指定，本规格书所陈述的所有测试均是在以下温湿度范围进行: 20±5℃，相对湿度 65±20%. 如果 测试结果不受 温湿度 环境 影响时， 这些测试可以在以下温湿度范围进行: 温度15℃ ~ 30℃，相对湿度 25% ~ 85%.

8. Cell Testing
电池粒测试

Items 项目		Test Instruments and Methods 测试工具和方法					Judgment Criteria 判断标准
8.1	Physical Appearance 外观	By visual check. 目视.					There are no excessive dirt, deformation and flaws. 无明显的脏污、变形、裂纹
8.2	Dimensions 尺寸	Measured by calipers. 用游标卡尺测量.					The allowance of dimensions is indicated in the Drawing appended in page 15. 参照规格书产品图示第 15 页.
8.3	Weight 重量	Measured by beam balance. 用天平称量.					≤ 47 g
8.4	Open Circuit Voltage 开路电压	Measured open circuit voltage within 1 hour after standard charging. 采用标准充电制式，充满电后1小时内测量.					4.2±0.03 V
8.5	Internal Resistance 内阻	Measured internal resistance within 1 hour after standard charging. 采用标准充电制式，充满电后1小时内测量.					≤ 48 mΩ
8.6	Capacity 容量	Measured capacity by standard discharging within 1 hour after fully charged by standard charging. 采用标准充电制式充电， 充满电后 1 小时内 采用 标准 放电 制式 测量.					≥ 2550 mAh
8.7	Discharge Rate Capabilities 倍率放电容量	Measured capacities by discharging (under conditions on the right) within 1 hour after standard charging: 采用标准充电制式后，在1小时内，在右方倍率条件检测放电的容量:	Discharging: 520 mA down to 2.75 V. 放电电流: 520 mA , 限制电压 2.75 V.				> 101%
			Discharging: 1300 mA down to 2.75 V. 放电电流: 1300 mA, 限制电压 2.75 V.				100%
			Discharging: 5 A down to 2.75 V. 放电电流: 5 A, 限制电压 2.75 V.				> 98%
8.8	Different Temperature Discharging 不同温度放电容量检测	Capacity comparison at different temprerature (as shown on the right), measured with constant discharge current 520 mA and 2.75 V cut-off after the standard charge: 采用标准充电制式后, 按电流 520 mA , 限制电压 2.75 V 在不同温度下 (示于右方) 放电, 检测出容量:	-20℃	-10℃	0℃	+25℃	+60℃
			≥ 72%	≥ 80%	≥ 85%	100%	≥ 102%

Items 项目		Test Instruments and Methods 测试工具和方法	Judgment Criteria 判断标准
8.9	Cycle Life 循环寿命测试	500 charging / discharging cycles were repeated in conditions below: 500 周充放电循环按以下方式重复, 如下: • Charging: 4.2 V, 1300 mA, 78 mA cut-off, CC-CV. 恒流恒压充电: 4.2 V, 1300 mA, 78 mA (截止电流). • Rest: 30 mins., between charging and discharging. 搁置: 30 mins., 在充电和放电工步之间. • Discharging: 2600 mA down to 2.75 V. 恒流放电: 2600 mA, 放电至 2.75 V. • Temperature: Measured capacity at 25±2℃ while the 501st cycle of standard charging / standard discharging is being performed. 温度: 在 25±2℃ 的环境下, 按照标准的充放电, 测试第 501 周循环的容量值.	≥ 1820 mAh
8.10	Storage 储存测试	The capacity was measured by standard discharging after storage: Stored the charged Battery Cell for 7 days at 55℃, and then performed standard discharging and quick charging cycle for 2 times. 储存之后通过标准放电制式检测出容量: 将满电的锂电池粒在55℃环境下储存 7天，然后 标准放电 和 快速充电 循环两次.	≥ 2080 mAh
		The capacity was measured by standard discharging after storage: Stored the discharged Battery Cell for 7 days at 55℃, and then performed quick charging cycle for 2 times. 储存之后通过标准放电制式检测出容量: 把无电的锂电池粒在 55℃ 环境下储存7 天，然后 在 快速充电制式下 循环两次.	≥ 2210 mAh
8.11	Leakage 泄漏测试	The Battery Cell was left in a place with ambient temperature of 33 ± 3 ℃ and relative humidity at 85 ± 5% for 2 weeks after standard charging. 将锂电池粒按标准充电制式满充后放入温度 33±3℃、 相对湿度 85±5% 的环境中两周.	No leakage. 不泄漏.
8.12	Vibration 振动测试	Vibrated the Battery Cell in triaxial direction for 90 mins. per axis in condition of frequency 10-55 Hz (1 Hz per min.) and amplitude 1.6 mm p-p. 在 X、 Y、 Z 三个垂直的方向上振动锂电池粒 90 分钟， 每个 方向的振动频率: 10-55 HZ (每分钟 1 HZ)， 振幅: 1.6 mm p-p.	No fire. No explosion. Voltage decrease ≤ 10 mV, AC iR increase ≤ 5 mΩ. 不着火，不爆炸，压降变化 ≤ 10 mV，内阻变化≤ 5 mΩ.
8.13	Shock Drop 跌落测试	Dropped the Battery Cell onto concrete board from 75 cm height for 3 times. 将锂电池粒从 75 cm 高处跌落在水泥地板上 三次.	No fire. No explosion. 不着火，不爆炸.
8.14	Short Circuit 短路测试	Short-circuit by a lead wire (resistance ≤ 30 mΩ) across the " + " and " - " terminals of the Battery Cell after standard charging. 标准制式充满电后, 用一根导线 (内阻 ≤ 30 mΩ) 连接 锂电池粒 的正负极.	No fire. No explosion. 不着火，不爆炸.
8.15	Over-charge Test 过充测试	Charged by constant current of 2 C and constant voltage of 10 V for 2 hours. 用 10 V 电压、2 C 电流充电 2 小时.	No fire. No explosion. 不着火，不爆炸.
8.16	Over-discharge Test 过放测试	After standard charging, discharged by constant current of 0.2 C to 2.75 V, and then connected the positive and negative terminals with a 30 mΩ wire for 24 hours. 按标准充电制式满充后, 然后按 0.2 C 电流放电至 2.75 V, 再用 30 mΩ 的 导线 连接 正负极 24 小时.	No fire. No explosion. 不着火，不爆炸.

9. Dimensions
尺寸

Dimensions Drawing - Refer to the drawing appended in page 15.
产品尺寸规格示意图 - 参考第 15 页.

10. Barcode Specifications
喷码说明

Barcode Help - Refer to the drawing appended in page 16.
条形码示意图 - 参考第 16 页.

11. Packaging
包装

11.1 Packing State - Charging capacity of the delivered Battery Cells is about 60%.
包装状态 - 每粒交付的锂电池粒容量约为满电容量的 60%.

11.2 Pack the Battery Cells (and battery packs) securely in carton box for transport to prevent short-circuit or damage during transport.

为防止锂电池粒 (和电池组) 在运输过程中短路或损坏，应把锂电池粒 (和电池组) 安全地放在瓦楞纸箱内.

12. Warranty
质保承诺

12.1 As long as the Battery Cells are treated in accordance with this PS-Document and the Prohibitions and Cautions stipulated therein, YLE warrants that the Battery Cells should be free from any defects for a period of one (1) year (stored at 23±2℃ or below) from the date of shipment.
只要客户按照规格书操作，不违反述及的禁忌和警告，并遵循注意事项，由付送日算起计的一 (1) 年内 (储存于 23±2℃ 或 以下温度)， YLE 担保锂电池粒的质量没有任何问题.

12.2 The warranty sets forth above or described in the Prohibitions and Cautions of Handling Rechargeable Lithium-ion Battery Cells excludes defects, which are not related to the manufacturing of the Battery Cell.
上述质保或者关于锂电池粒注意事项的描述并不包含锂离子电池粒制造过程中固有的缺陷.

12.3 In the event defect is found in the Battery Cell(s), YLE will replace the defective battery cell without cost only if all the following conditions are met:
如果锂电池粒存有缺陷，而又完全符合以下所有条件的情况下，YLE 会以无偿的方式更换有缺陷的锂电池粒:

(i) The defect is found and reported to YLE within one (1) year from the date of shipment of the defective Battery Cell(s).
有缺陷的锂电池粒是于发货之日起计一年内被发现并上报 YLE.

(ii) The defect is caused by the reasons attributable to YLE, such as defect in design or manufacture of Battery Cell(s).
缺陷的原因是归因于 YLE ，比如锂电池粒因设计或制造引起的缺陷.

(iii) It is clear that the defect is not caused by reasons attributable to any third party other than the YLE, such as any misuse of the Battery Cells or failure to comply with terms and conditions stated in this PS-Document.
锂电池粒的缺陷并非归属于 YLE 以外的任何第三方，比如因滥用电池粒引起或未能遵守本规格书所载的条款和条件.

13. Warranty Exemptions
质保豁免

13.1 YLE will not be liable for any damages that are caused by violations of the Prohibitions and Cautions stated in this PS-Document.
YLE 不会为因违反本产品规格书所描述的产品禁忌、警告和注意事项而导致的的任何损失负责.

13.2 YLE will not be liable for any problems caused by the design defects of the battery packs, the device(s) and/or the chargers.
YLE不会为电池组、充电器和产品的设计缺陷的后果负责.

13.3 YLE will not accept return of any abnormal and/or damaged battery cells that were caused by incorrect and/or inappropriate assembly process.
YLE不会回收因不正确 和/或 不恰当的组装过程中造成的任何异常 及/或 损坏的锂电池粒.

14. Document Terms and Conditions (Tentative Specifications)
规格书条款及细则 (暂定规格)

14.1 The expiration period for this PS-Document is six (6) months from the issue date.
本产品规格书的有效期为首页之发送日期起计六 (6) 个月.

14.2 If a new revision of PS-Document is released, please return or destroy the previous revision.
当产品规格书的新版本发布时，请退回或销毁之前的旧版本.

14.3 This PS-Document is still in its preliminary state. The contents are subject to change.
本产品规格书仍然处于初级状态，内容还会有调整变动的.

15. Others
其他

15.1 Long Period of Storage: If the Battery Cells or the packs are to be preserved for a long period of time (3 to 4 months), the Battery Cells or the packs should be stored in an environment with 40±20% RH and 23±2℃ temperature.
长期储存: 如果锂电池粒或者电池组需要长期储存 (3 至 4 个月)，储存环境为 23±2℃，相对湿度为 40±20%.

15.2 Any other matters that the PS-Document does not cover should be conferred between the both parties.
其他本规格书没有包含的事项由客户和 YLE 双方共同协商.

Prohibitions and Cautions in Handling Rechargeable Lithium-ion Battery Cells / Packs
关于锂离子二次充电电池粒/锂电池组的禁忌、警告和注意事项

1. Scope
范围

1.1 This PS-Document also defines the Prohibitions and Cautions in handling the INR18650A260 A Rechargeable Lithium-ion Battery Cells. The Battery Cells which YLE supplies to Customers should be used for the designated general products.

本规格书限定的注意事项，适用于由 YLE 提供给 客户 作为生产 一般产品 而专门设计的 INR18650A260 A 锂离子 二次 充电 电池粒.

1.2 When the Battery Cells are used under terms and conditions which are differed from those stated in this PS-Document, different restrictions and conditions shall apply. Therefore, please consult YLE before changing the Battery Cell usage as designated. YLE is not responsible for the troubles and problems to be caused by the mishandling of the Battery Cells, which is clearly against the terms and conditions in this PS-Document. When YLE finds any new factors which require modification of the contents of this PS-Document, we will advise you accordingly.
当 锂电池粒的使用 与 本规格书 所述的使用条款和条件不同时, 应当留意 和 采用不同的限制因素和条件. 故此，在 改变 锂电池粒 的标注用途前， 请咨询 YLE. 对于 客户 因 违反 本规格书 所述 的 条款 和条件, 不当 使用 锂电池粒 而造成的 过错 和 问题, YLE 将 不承担责任. 当 YLE 发现 本规格书 有需要 更改 的内容, YLE 将会据此通知.

2. General Prohibitions and Cautions in Handling the Rechargeable Lithium-ion Battery Cells
处理锂离子二次充电电池池粒的常规、禁忌和警告事项

2.1 Keep away from infant and children. If the battery or any of its component part is swallowed, seek medical attention immediately. When electrolyte of the Battery Cells splashes into the eyes, immediately flush the eyes thoroughly with clean water without rubbing; followed by taking medical treatment immediately. If appropriate procedures are not taken, this may cause a loss of sight. If leaked electrolyte comes into contact with skin or clothing, immediately flush with water.
远离婴儿和儿童. 如果锂电池粒或任何其组件部分被吞入,立即就医. 当电解液溅入眼睛, 不要用手揉搓, 请立即用大量清水冲洗，然后及时就医治疗,如果不按正确程序处理,可能会造成失明. 如果皮肤或衣服接触到泄漏的电解液,请立即用大量清水冲洗.

2.2 Mishandling of the Battery Cells may cause heat, smoke, explosion and fire. Be sure to observe the following:
滥用锂电池粒会造成锂电池粒发热、冒烟、爆炸和起火, 请遵守以下注意事项:

(i) Do not throw the Battery Cells into fire or heat them.
禁止将锂电池粒扔进火里或者加热它.

(ii) Do not mix Battery Cells of different chemistry, capacity or manufacturer for use.
不可把不同化学成分，容量或制造商的锂电池粒混合一起使用.

(iii) Do not use the Battery Cells with " + " and " - " in reverse. Also, do not connect the battery to an AC outlet or DC automotive plug.
使用锂电池粒, 禁止将锂电池粒正负极装反. 另外，不要将电池连接到交流电源插座或汽车 DC 插头.

(iv) Do not connect " + " and " - " terminals with conductive materials or other metal (i.e. do not short-circuit the Battery Cells).
禁止用导电材料或者其他金属短接锂电池粒的正、负极 (禁止短路锂电池粒).

(v) Do not pierce the Battery Cells with a nail, strike them with a hammer, step on them or otherwise subject them to strong impact.
禁止用钉子刺穿锂电池粒, 禁止用锤子敲打锂电池粒, 禁止浸泡或者强力冲击锂电池粒.

(vi) Do not directly solder on the Battery Cells.
禁止直接焊接锂电池粒.

(vii) Do not allow the Battery Cells to be immersed in or wetted with water, sea-water, beverages, or other fluids.
禁止将锂电池粒浸入水, 海水, 饮料, 或其它流体.

(viii) Do not put the Battery Cells into microwave oven or high pressure container.
禁止将锂电池粒放入微波炉或者高压容器中.

2.3 Never disassemble or modify the Battery Cells. The safety mechanisms are incorporated in the Battery Cells to prevent danger. Damaged safety mechanisms may cause heat, smoke, explosion and fire.
禁止拆卸或者改装锂电池粒，锂电池粒里面有避免危险的安全装置，损坏安全装置可能会造成电池发热、冒烟、爆炸或者起火.

2.4 Do not leave the Battery Cells in places of high temperature, like beside a fire or stove or under strong direct sunlight. This may cause heat, smoke, explosion and fire. In addition, performance and life span of the Battery Cells may be deteriorated.
禁止将锂电池粒放在高温地方，比如火边、炉子边或者在阳光下直射，否则会造成电池发热、冒烟、爆炸和起火，除此之外，还会造成锂电池粒性能下降和使用寿命缩短.

2.5 Immediately stop using the Battery Cells if you notice heat, discoloration, rust, deformation, damage on the external tube, or anything wrong, during use or storage of the Battery Cells. Move the Battery Cells away from a fire immediately when you noticed a foul odor due to leakage.
在使用或者储存过程中，发现锂电池粒发热、沾污、锈、变形、外膜破损或者其他不良，请立即停止使用该锂电池粒；当发现锂电池粒泄漏不良气味时，请立即将锂电池粒远离火源.

3. Prohibitions and Cautions for Designing Chargers and Battery Pack for Pedelec
电动自行车充电器、锂电池组设计和组装的禁忌、警告和注意事项

Please comply with the following instructions during every stage of application, charger and battery pack design and assembly processes. Otherwise, the Battery Cells may experience a deterioration of functionality, quality and safety. In the worst case, the battery packs may generate heat, smoke, catch fire or explode.
在充电器的设计，电池组的设计和装配过程的每一个应用阶段，均请遵照下面的应用程序说明. 否则， 锂电池粒的功能、 质量和 安全性 可能会遇到坏的影响；在最坏的情况下，电池组可能会产生热量，烟雾，着火或爆炸.

3.1 Prohibitions and Cautions for Designing Chargers for Pedelec
电动自行车充电器设计的禁忌、警告和注意事项

3.1.1 Design of Chargers for Pedelec
电动自行车的充电器设计

- The Battery Cells should be kept away from heat generating electronic parts in order to avoid deterioration of battery performance.
  把锂电池粒和发热电子零部件保持距离，以避免电池组性能的变差.

3.1.2 Charging
充电

(i) The battery pack should be charged by means of constant current-constant voltage.
电池组应以恒定电流 - 恒定电压的模式充电.

(ii) The charging current should not exceed 2600 mA (1 C) per cell for INR18650A260 A.
每颗 INR18650A260 A 锂电池粒的充电电流不应该超过 2600 mA (1 C).

(iii) The charging voltage should be set at less than 4.2 V per cell with considering the accuracy of the charger to secure total safety in case of charger failure.
每颗锂电池粒的充电电压应设置低于 4.2 V，此外还应顾及並确保充电器的精准度，以确保在故障情况下的安全.

(iv) The charger should be equipped with a pre-charge system.This is to ensure that if battery voltage goes down to less than 2.75 V per cell, the battery should be charged by pre-charge current of maximum 520 mA. Once the battery has been pre-charged to more than 2.75 V per cell, the charger can resume its standard charging method. However, if the battery voltage never recovers more than 2.75 V per cell, the charger must be stopped and turned off.
充电器应配备一个预充电系统.这是为了确保如果每颗锂电池粒的电压下降到小于 2.75 V 时，充电器的预充电系统会以最多 520 mA 的电流充电. 当电池组充电至每颗锂电池粒 2.75 V，充电器便可恢复它的标准充电方法. 然而， 如果 电池组 的 电压 不能恢复 至 每颗锂电池粒高于 2.75 V，必须 停止充电并把充电器关闭.

(v) The charger should be equipped with a full charge detection device.The charger should be able to detect the full-charged state by a timer, current detection or open circuit voltage detection, so that charger would stop charging once full-charge is detected. Do not apply the continuous charging (trickle charging) method.
充电器应配备一个满充电检测装置.充电器应该能够透过一个计时器装置、电流检测装置或开路电压检测装置，从而使充电器一旦检测到满充电状态时便停止充电. 不要使用涓流充电方法连续充电.

(vi) The charging temperature should be confined to the range of 0°C to +45°C.
充电温度应限制在 0°C 至 +45°C 的范围内.

(vii) It is recommended that charging would stop automatically once either of the following conditions is met:
建议在下列任何一条件下充电会自动停止:
- The charging current has reached approximately 78 mA (0.03 C) in CV mode.
  当充电电流已达到 CV 模式大约 78 mA (0.03 C).
- The charging time has reached four (4) hours in case of charging at 1300 mA.
  在 1300 mA 充电的情况下，充电时间已达到四 (4) 小时.

3.1.3 Discharging
放电

(i) The discharge current should not exceed 5 A per cell.
每颗锂电池粒的放电电流不应超过 5 A.

(ii) The discharge temperature should be within the range from -20°C to +60°C.
放电温度的范围应为 -20°C至 +60°C 之內.

(iii) The discharge end voltage should be more than 2.75 V per cell.
每颗锂电池粒的放电终止电压应该为 2.75 V以上.

3.1.4 Over-discharging
过放电

- Do not discharge The battery to less than 2.3 V per cell.
  不要将电池组的每颗锂电池粒放电到低于 2.3 V.

3.2 Prohibitions and Cautions for Designing Battery Packs for Pedelec
电动自行车的锂电池组设计和组装的禁忌、警告和注意事项

3.2.1 Shape, Mechanism and Materials
形状，力学和材料

(i) Designed to prohibit connecting with unauthorized chargers and/or unauthorized equipments / devices.
电池组的设计旨在禁止连接到未经核批的充电器 和/或 未经核批的设备/器材.

(ii) Terminal shape should be designed to avoid short-circuit issues. The battery pack should also be equipped with an over-current protection function to prevent short-circuit to be caused by external factors.
终端的形状设计应可避免短路的问题。电池组还应配备过流保护功能，以防止由外部因素造成的短路.

(iii) The terminal shape and structure should be designed to prevent backwards connection.
终端的形状和结构设计，应可防止反方向连接.

(iv) The battery pack should be designed to allow inspection of the functions of all protection circuits during the assembly process.
电池组的设计应允许在组装过程中，可检测所有保护电路的功能.

(v) The battery pack should be designed so that electrolyte cannot reach the protection circuit board even if there is electrolyte leak.
电池组的设计应在即使有电解质泄漏情况，也不会让电解质传达到保护电路板.

(vi) Select Battery Cells of the same rank with appropriate voltage so that the difference in maximum voltage between the battery cells could be maintained in less than 20 mV. Furthermore, do not mix Battery Cells of different chemistry, capacity or manufacturer for use.
选用同分级标准和电压相约的锂电池粒，以确保不同的锂电池粒之间最大电压差距不超过 20 mV. 此外， 也不可把不同 化学成分， 容量 或 制造商 的锂电池粒 混合一起使用.

(vii) The Battery Cells should be fixed by tape or glue within casing so as to protect the cells against dents, deformation and other mechanical stresses should the battery pack be dropped.
应该用胶纸或胶水把锂电池粒固定在电池壳内部，从而防止电池组从高处跌落时带来凹痕、变形或其他机械应力.

(viii) If the pack case is welded by ultrasonic welding, the conditions must be set to keep the functions and protection circuitry of the Battery Cells normal. Plastic casing should be closed with glue. YLE will not accept any responsibilities for any defects if ultrasonic welding is employed.
如果用超声波焊接，必须在适合条件下进行，确保锂电池粒和保护线路板的性能功能为正常. 电池组的塑料外壳应以胶水封闭. YLE不会因采用超声波焊接塑料外壳而带来的任何缺陷而承担任何责任.

(ix) Battery packs should NOT be designed as a sealed construction. However, battery packs should be designed in such a way that protection circuits and/or the Battery Cells in the battery pack can NOT be easily taken out by consumers.
锂电池组的设计不宜为密封的模式; 不过， 也不应让用户能很轻易地把保护线路板和锂电池粒从锂电池组取出.

3.2.2 Battery Management System and Protection Circuit
锂电池管理系统和保护电路

There should be the endorsed Battery Management System and protection circuits for safety reasons. Protection circuits could be damaged by electrostatic discharge (ESD). Do anti-electrostatic treatment in the process of enforcing circuit protection. The following protection circuits should be equipped with the battery pack:
出于安全原因，应配置认可的锂电池管理系统和保护线路. 保护线路板可能会被静电放电损坏， 实施线路保护过程中必须 做抗静电处理. 电池组应配置有以下的保护电路:

(i) Over-charge Protection
过充电保护

Max. over-charge protection voltage of each block should be under 4.25 V per cell, including tolerance.
每颗锂电池粒包括公差的最高过充电保护电压上限应为 4.25 V.

(ii) Over-discharge Protection
过放电保护

It is recommended to design the over-discharge protection circuit to shut down the discharge current when cell voltage is drained down to approximately 2.3 V per cell. The circuit consumption current should be set at less than 1 μA.
建议当每颗锂电池粒的电压下降低致 2.3 V时，过放电保护电路的设计可自动把放电电流关闭; 而电路的消耗电流 设置 应为小于 1 μA.

(iii) Over-current Protection
过流保护

Over-current protection to shut off the current when discharge current exceeds approximately 6 A per cell.
当每颗锂电池粒的放电电流超过近 6 A 时，过流保护应启动把电流切断.

3.2.3 Electric Circuit
电路

- To avoid over-discharge mode during long storage time, the consumption current of the battery pack's protection circuit should be set to as low as possible.
  为了避免电池组在长期存储时处于过放电模式中，电池组保护电路的消耗电流应尽可能设定致最低的水平.

3.2.4 Battery Cells Connection
电池粒连接

Do not solder directly to the Battery Cells. If the Battery Cells are soldered directly, the insulation materials may be melted or the safety mechanisms may be damaged by heat. This may cause heat, smoke, explosion and fire. Be sure to observe the following to prevent any damages caused by the heat of soldering:
禁止直接焊接锂电池粒，如果直接焊接锂电池粒，绝缘材料和安全装置会受热熔化或破坏，从而造成锂电池粒发热、冒烟、爆炸和燃烧. 请按照以下事项以防止焊接时发热对锂电池粒造成损坏:

(i) Spot-weld a connection tab with the pre-soldered lead wires to the Battery Cells.
用带有焊锡的焊接导线 ，以点焊的方式把极耳焊在锂电池粒上.

(ii) Solder the connection tab which is already spot-welded to the Battery Cells. In this case, please be sure that the elements of the tab length and shapes as well as the temperature and soldering time do not cause damages to the Battery Cells by heat.
焊接已经焊好在锂电池粒上的极耳时，请确保极耳的长度、形状以及焊接的温度和时间，防止高温对锂电池粒造成损伤.

3.2.5 Battery Pack Materials:
锂电池粒组装物料:

(i) As for rosin case, use the rosin comprising polycarbonate which gives excellent electrolyte-resistant performance (YLE recommends using rosin with UL approved standard - the flameproof 94V-0).
若使用松香，应用含聚碳酸酯成份的，因其具有优异的电解质性能 (YLE 建议使用具备 UL认证标准 - 防火 94V-0 的松香).

(ii) In the case of using solder, YLE recommends RMA flux because its residue is not significantly corrosive, with cleaning being preferred but optional.
若是焊接，YLE 建议用 RMA 助焊剂，因其残留物的腐蚀性并不显著，且便于清洁，此建议只供参考选择.

(iii) As for other materials, YLE recommends using materials with UL approved standard.
至于其他物料，YLE 建议使用通过UL标准认证的物料.

3.2.6 Process Inspection - Be sure to implement inspections in the following areas:
制程检查 - 检测以下项目以确保安全妥当:

(i) The function of protection circuit.
保护线路板的功能.

(ii) The voltage and the internal-resistance of the Battery pack.
锂电池组的电压和内阻.

(iii) The resistance of the thermistor (where the battery packs are using the thermistor).
热敏电阻的内阻 (若锂电池组是使用热敏电阻).

(iv) The outlook of the thermal fuse (if thermal fuse is used in the battery packs).
热熔保险丝的量程 (如果锂电池组使用到热熔保险丝).

3.2.7 Handling of Exposed Contacts or Conductors
外露的接触 / 导线的处理

- Design the battery pack to ensure insulating the wires, both internal and external, of the battery pack with the insulation tape, etc. to prevent internal short-circuit. It is because the external tube of the Battery Cells could be damaged or deformed by external force or heat.
  设计锂电池组时请确保锂电池组内外的导线用绝缘胶等绝缘，防止内部短路，因为锂电池粒的套膜可能会因为外力和受热而破损和收缩.

3.2.8 Strength of the Battery Pack Enclosure
电池组外壳强度的设计

- The battery pack enclosure must be designed to have sufficient strength to resist damage from specified or typical expected mechanical stress, such as bending, twisting and impact due to drop of application (from height).
  电池组外壳必须被设计为具有足够的强度，抵抗预期的指定或典型的机械应力，如从高处下跌而导致弯曲，扭转和冲击造成的损害.

3.2.9 In the case of Cylindrical Battery Cells:
圆形锂电池粒情况:

- Spot-weld approximately at the areas as shown in the Dimensions Drawing in Page 15 (indicated by ”+“) because the surface layer on the side of negative (”-“) terminal is very thin and could easily be damaged by spot-welding.
  点焊的大概区域如 15 页的尺寸规格图示 (用 “ + ” 表示) 所示，因为 “ - ” 负极的表层很薄，很容易被焊头损坏.

3.2.10 In the case of Prismatic Battery Cells:
方形锂电池粒情况:

- Please pay attention to the space of the pack when designing battery packs using Prismatic Battery Cells. It is because Prismatic Cells swell at the initial state at shipment, after use and/or storage.
  当用方形锂电池粒设计电池组时请注意空间，因为方电在使用之后或者在储存期间会膨胀.

4. Prohibitions and Cautions in Charging the Lithium-ion Battery Cells
锂离子二次充电电池粒充电过程中的禁忌、警告和注意事项

4.1 When the Battery Cells are charged, use specified charger and the specified charge method and temperature range, voltage, and current described in this PS-Document should apply. If charge current exceeds the upper limit of the specified range, characteristics and safety of the Battery Cells would be deteriorated, or it may cause heat, smoke, explosion and fire.
锂电池粒充电时，应当使用指定的充电器并按照规格书描述的充电方式和温度范围，电压和电流，如果充电电流超过上限，会使锂电池粒使用性能和安全性能下降，或者造成电池发热、冒烟、爆炸和起火.

4.2 Even though the charge voltage of the Battery Cells is 4.2 V±0.03 V, charge voltage should not exceed 4.2 V. Otherwise, the characteristics of the Battery Cells would be remarkably deteriorated.
虽然锂电池的充电电压是 4.2 V±0.03 V，但实际充电电压应不超过 4.2 V，否则锂电池粒性能将会显著的恶化.

4.3 The Battery Cells shall be charged within the range of Operating Ambient Temperature as stipulated in the PS-Document; and the Battery Cells temperature may not exceed 60℃ during charging. Stop charging if the charging process cannot be finished.
锂电池粒充电的环境温度应在规格书规定的范围内，锂电池粒放电过程中电池外表的温度不超过 60℃. 如果 充电过程 不能完成便应停止充电.

5. Prohibitions and Cautions in Discharging the Lithium-ion Battery Cells
锂离子二次充电电池粒放电过程中的禁忌、警告和注意事项

5.1 The discharge current should not exceed the designated current described in this PS-Document. If the discharge current exceeds the specified value, discharge capacity could be extremely deteriorated or the Battery Cells could be heated.
锂电池粒的放电电流应不超过规格书规定的放电电流. 如果放电电流超过规定的数值， 放电容量将会很低或者锂电池粒外表 过度发热.

5.2 The discharge temperature range should be the specified value as stipulated in this PS-Document.
放电的温度范围应和规格书规定的一致.

5.3 When Battery Cells are stored for a long period of time, they would become over discharged due to self discharge. Battery Cells with voltage less than over-discharge-protection-reset-voltage must be charged with small current for a few minutes. If voltage of Battery Cells could not be recovered to over-discharge-reset-voltage after charging with small current charging, do not charge them again.
当锂电池粒长期储存，会因自放电而出现过放现象。当锂电池粒电压低于锂电池粒放电下限电压，先用小电流给锂电池粒充电几分钟，如果小电流充电后电压不能恢复，不要再对这颗锂电池粒充电.

6. Prohibitions and Cautions for the Battery Cells Storage
储存锂电池粒的禁忌、警告和注意事项

6.1 Do not store Battery Cells in places of high temperature or under direct sunlight.
禁止将锂电池粒储存在高温或者太阳直射的地方.

6.2 Do not store Battery Cells in places of high humidity or in places where may expose the Battery Cells to moisture, rain or water.
禁止将锂电池粒储存在潮湿的地方或者暴露在水汽、雨水和水打湿的地方.

6.3 Do not store Battery Cells together with combustibles.
禁止将锂电池粒和易燃品储存在一起.

6.4 Store Battery Cells in the state of discharge (remaining capacity: 20% ~ 30%) when the Battery Cells are to be stored for a long period of time.
当锂电池粒需要长期储存时，请保持锂电池粒处于带电状态 (残留容量：20% ~ 30%).

6.5 Battery Cells are of chemical product utilizing chemical reactions. Hence, the performance of Battery Cells will deteriorate not only through use, but also with the passage of time even if they are left unused.
锂电池粒是一种利用化学反应的化学产品，所以，它的性能不只是在使用过程中会退化，随着时间推移，就算是没有使用，它的性能也会退化.

7. Prohibitions and Cautions for Disposal of the Lithium-ion Battery Cells
处置锂电池粒的禁忌、警告和注意事项

7.1 Dispose the damaged Battery Cells during the process of Battery Cells pack assembly, and other causes, etc. after taking the necessary steps to prevent external short-circuit by the method below:
处置在锂电池粒组装过程中或者其他原因造成的报废电池，请参照以下步骤以防止锂电池粒外部短路:
After insulating the terminals of the Battery Cells with tape etc., dispose them under the laws or regulations of national, federal, and respective local governments.
将锂电池粒的正、负极用胶带或者其他物品包住，令正、负极不会接触，然后按照国家、联邦 和 各自地方政府 的 法律、 法规 处置.

7.2 As for the charged Battery Cells, after discharging them with a resistor, dispose them in accordance with the above-stated method.
对于带电的锂电池粒，用一个电阻将电放完之后，然后依照上述的方式处置.

8. Cautions for Marking
警告标志

Please indicate Lithium-ion Battery Cell Safety Cautions, based on "Marking Guideline to ensure safety of storage batteries", on a Battery Cell pack, packing materials, and handling manuals. It should be indicated in the manner that users can fully and easily understand.

在电池组、包装物料和使用手册上，请根据 “电池安全储存指导标志”， 标志 锂离子二次充电电池粒 的安全注意事项， 表述的 方式 应该 让使用者 很容易 和 清楚理解.

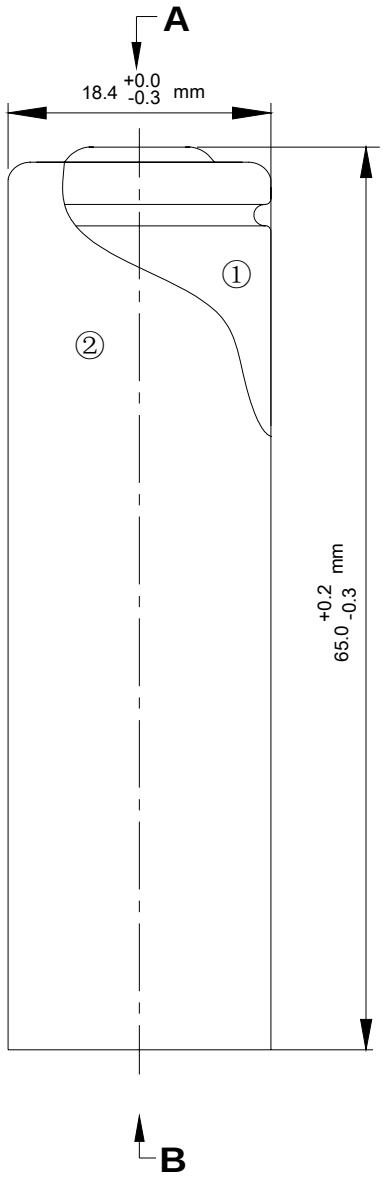
YLE's recommended Marking of Battery Cells' Caution Label:
YLE 建议的 锂电池粒安全说明标志：

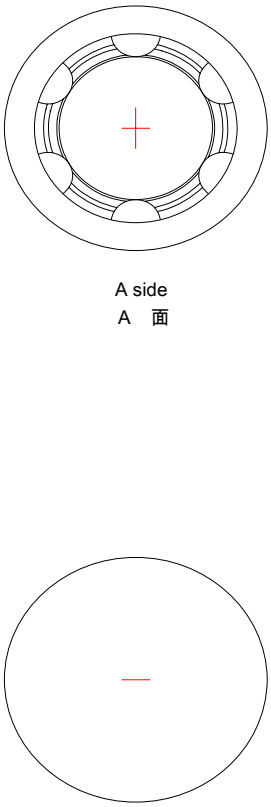
Danger! 危险!	• Rechargeable Li-ion Battery Cell: INR18650A260 A 锂离子二次充电电池: INR18650A260 A • Do not heat Battery Cells or throw them into a fire. Do not charge, use and leave Battery Cells at places of high temperature. 禁止将锂电池粒加热或者扔进火中，禁止在高温的地方充电、使用或者放置. • Do not deform, short-circuit, disassemble or modify Battery Cells. 禁止使锂电池粒变形，短路，禁止拆卸和改装锂电池粒. • Do not let Battery Cells be immersed in or wetted with moisture, water or sea-water. 禁止将锂电池粒浸入淡水和海水中，或者用湿气、淡水 或 海水 淋湿. • Do not subject Battery Cells to strong impact or throw them around. 禁止对锂电池粒进行强力撞击或者抛掷锂电池粒.
	Failure to observe the above cautions may cause heat, smoke, explosion and fire. 不遵守以上警示会造成锂电池粒发热、冒烟、爆炸和起火.

RECHARGEABLE LITHIUM-ION BATTERY CELL (锂离子二次充电电池粒)

Product Drawing (产品示意图)

Symbol 符号	Date 日期	Revision 修订	Signed 签名	Checked 审核
	2019-04-25		龙霞	樊育良





A side
A 面

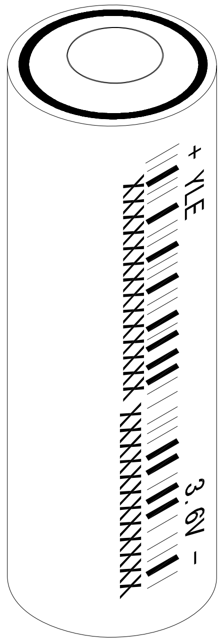
Symbol 符号	Name 名称	Materials 材质	Qty. 数量		
②	Outer Jacket 外膜	PVC	1		
①	Battery Cell 电芯	INR18650A260 A	1	Process 工序	Remarks 备注

Scale 比例	Designed 设计	Drawn 绘图	Prepared 拟定	Checked 审核	Approved 批准	Model No.: 型号代码:	INR18650A260 A
Free	朱林春	龙霞	龙霞	樊育良	董超祺	Name: 名称:	Dimensions Drawing 尺寸规格图示

RECHARGEABLE LITHIUM-ION BATTERY CELL (锂离子二次充电电池粒)

Barcode Drawing (条形码示意图)

Symbol 符号	Date 日期	Revision 修订	Signed 签名	Checked 审核
	2019-04-25		龙霞	樊育良



+ YLE 3. 6V -

XXXXXXXXXXXX XXX XXXX XXXXX

Model No. 型号代码

Manufacture No. 制造号码

Lot No. 批次代码

Series No. 流水代码 (00001~99999)

Lot No. Details:
批次代码详解: X X XX

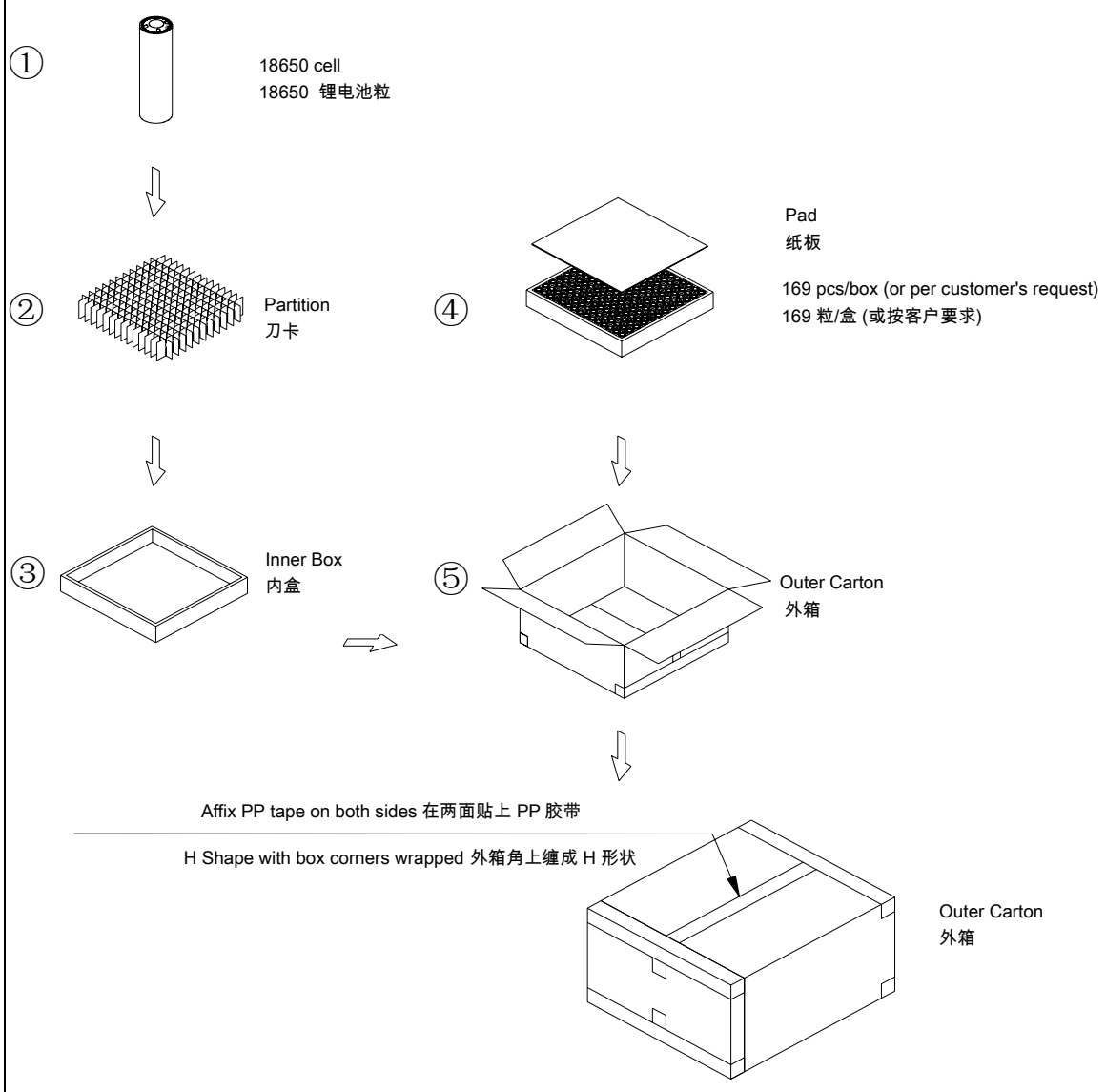
1 = Year 2011; 1 = 2011年;	2 = Year 2012; 2 = 2012年;	3 = Year 2013; 3 = 2013年;	4 = Year 2014 4 = 2014年	Year 年
1 = Jan; 1 = 1月;	A = October; A = 10月;	B = November; B = 11月;	C = December C = 12月	Month 月
	01 = The first day ~ 31 = The 31st day 01 = 1号 ~ 31 = 31号			Day 日

Symbol 符号	Name 名称	Materials 材质	Qty. 数量		
				Process 工序	Remarks 备注

Scale 比例	Designed 设计	Drawn 绘图	Prepared 拟定	Checked 审核	Approved 批准	Model No.: 型号代码:	INR18650A260 A
Free	朱林春	龙霞	龙霞	樊育良	董超祺	Name: 名称:	Barcode Drawing 条形码图示

Package Drawing 1 (包装图示1)

Symbol 符号	Date 日期	Revision 修订	Signed 签名	Checked 审核
	2019-04-25		龙霞	樊育良

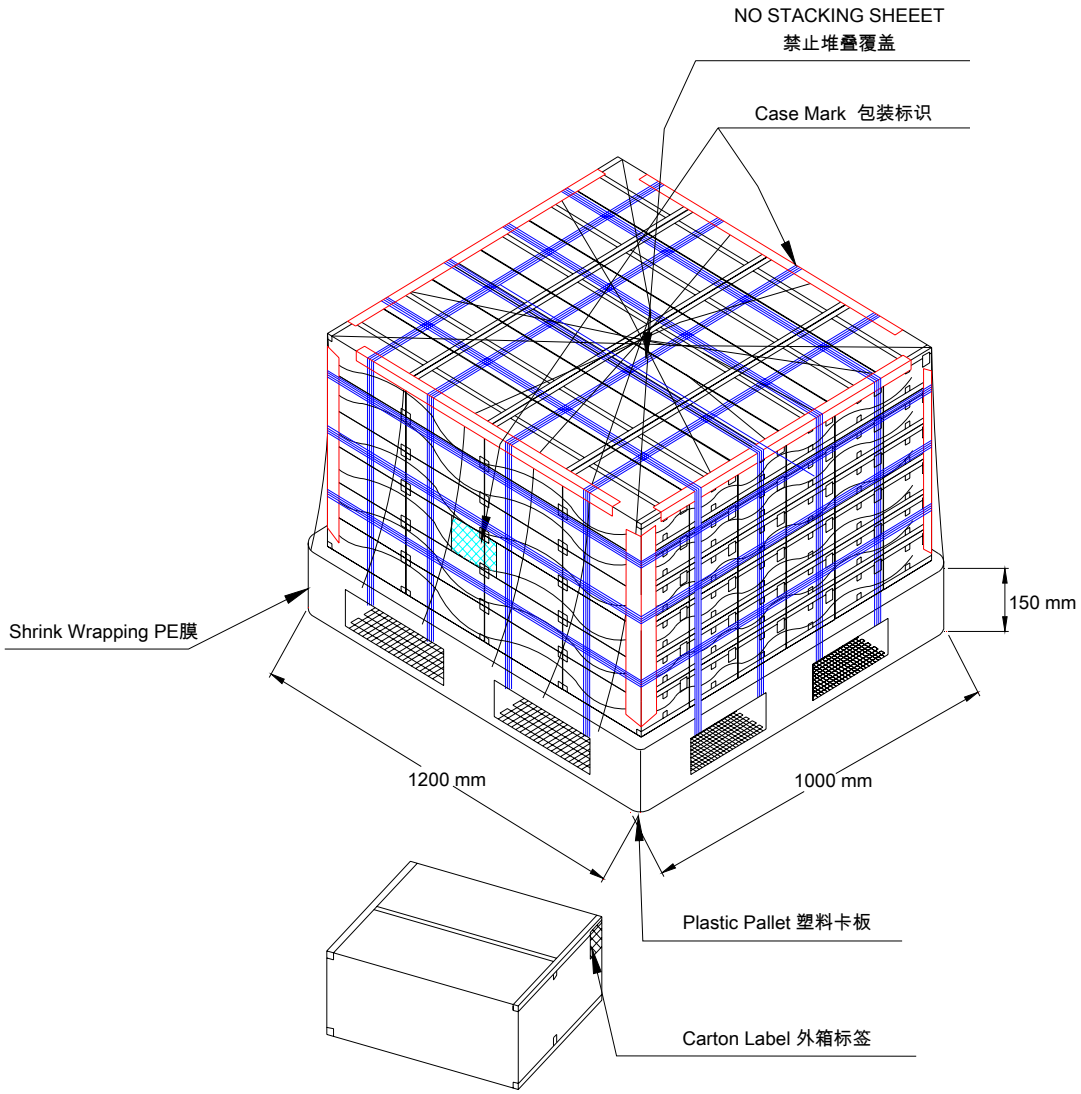


Symbol 符号	Name 名称	Materials 材质	Qty. 数量
①	18650 Cell 锂电池粒	Cell 锂电池粒	169 pcs (or per customer's request) 169 粒 (或按客户要求)
②	Partition 刀卡	Paper 纸	1 pcs 一件
③	Inner Box 内盒	Paper 纸	1 pcs 一个
④	Pad 纸板	Paper 纸	1 pcs 一件
⑤	Outer Carton 外盒	Paper 纸	1 pcs 一个
			Process 工序 / Remarks 备注

Scale 比例	Designed 设计	Drawn 绘图	Prepared 拟定	Checked 审核	Approved 批准	Model No.: 型号代码:	INR18650A260 A
Free	朱林春	龙霞	龙霞	樊育良	董超祺	Name: 名称:	Package Drawing 1 包装图示 1

Package Drawing 2 (包装图示2)

Symbol 符号	Date 日期	Revision 修订	Signed 签名	Checked 审核
	2019-04-25		龙霞	樊育良



Symbol 符号	Name 名称		Materials 材质			Qty. 数量		
							Process 工序	Remarks 备注
Scale 比例	Designed 设计	Drawn 绘图	Prepared 拟定	Checked 审核	Approved 批准	Model No.: 型号代码:	INR18650A260 A	
Free	朱林春	龙霞	龙霞	樊育良	董超祺	Name: 名称:	Package Drawing 2 包装图示 2	