可充电锂离子电池规格书

Specification of Product

for Lithium-ion Rechargeable Cell

型号 Model: MX18650-26P
3.6V 2600mAh（0.5C 充 0.2C 放）

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制定(Prepared By): 曹龙山 日期 Date: 2017年6月28日

审核(Checked By): 王民明 日期 Date: 2017年6月28日

批准(Approved By): 日期 Date: 2017.6.28

客户确认 Customer Approval	签名 Signature	日期 Date

地址：福建省漳州市诏安县金都工业园区
Address: Jindu Industrial Park, Zhao'an County, Zhangzhou City, Fujian, China
电话/Tel.: +86-596-6096301
传真/Fax.: +86-596-6096301
邮编/P.C.: 363500

修订记录
History of Revisions

版本号 Rev. No.	日期 Date (yr.m.d)	修订内容 Description	制订 Proposed by
A/0	2016.07.01	新版本 Initial release	谢建文
A/1	2017.04.27	增加内容	曹虎山
A/2	2017.06.28	增加内容	曹虎山

1. 范围 Scope

本规格书适用于猛狮新能源科技有限公司提供的 MX18650-26P 可充电锂离子电芯。

This product specification defines the requirements of the rechargeable lithium ion cell to be supplied to the Customer by Dynabat New Energy Science & Technology Co., Ltd.

2. 产品型号 Description and Model

2.1 产品 Description: 电池 Lithium-ion rechargeable cell

2.2 型号 Model: MX18650-26P

2.3 地点 Site: 福建漳州 Zhangzhou, Fujian

3. 产品规格 Nominal Specifications

项目 Item	条件 Condition	规格 Specification
3.1 标称容量 Nominal Capacity	标准充放电 （参考 6.2.1 及 6.2.2） Std. charge/discharge(Refer to 6.2.1 and 6.2.2)	2600mAh
3.2 能量 Energy	仅供参考 for reference only	9.36Wh
3.3 额定电压 Nominal Voltage	/	3.6V
3.4 标准充电 Standard Charge	恒流 Constant Current 恒压 Constant Voltage 截止电流 End Condition	0.5C (1250mA) 4.2V 52mA
3.5 最大充电电压 Max. Charge Voltage		4.2V
3.6 最大充电电流 Max. Charge Current		1.0C (2600mA)
3.7 标准放电 Standard Discharge	恒流 Constant Current 截止电压 End Voltage	0.2C (520mA) 2.75V
3.8 最大放电电流 Max. Discharge Current		2.0C (5200mA)
3.9 循环寿命 Cycle life	参照 6.2.3 Refer To 6.2.3	500 次循环保持初始容量的 90%或以上； 500cycles ≥ 90% of Initial Capacity. 或者 1000 次循环保持容量的 80%或以上； Or 1000cycles ≥80% of Initial Capacity
3.10 重量 Cell Weight		≤45g
3.11 尺寸 Cell Dimension	参照 4.0 Refer To 4.0	高度 Height: Max 65.3mm 外径 Diameter: Max 18.55mm
3.12 标准配组规格 Grading specification	容量 Capacity 电压 OCV 内阻 ACR	30mAh 8mV 4mΩ

3.13 使用温度 Operating Temperature	充电 Charge	0 to 45℃
	放电 Discharge	-20 to 60℃
3.14 存储温度 Storage Temperature (40%SOC)	1 个月 1 month 3 个月 3 month 1 年 1 year	-20° C ~ 60℃ -20° C ~ 45℃ -20° C ~ 25℃

4. 外形尺寸 Outline Dimensions

MX18650-26P 外形尺寸图

5. 外观 Appearance

电池外观无影响到产品使用的缺陷，包括：无破裂、划痕、变形、污迹、锈渍、无漏液等。

There shall be no such defects as deep scratch, crack, rust, discoloration or leakage, which may adversely affect the commercial value of the cell

6. 标准测试条件 Standard Test Conditions

6.1 环境条件 Environmental standards

除有特殊说明外，所有的测试均在温度：25±2℃；相对湿度：65±20%RH。

Unless otherwise specified, all tests stated in this specification are conducted at temperature 25±2℃ and humidity 65±20%RH.

6.2 标准测试方法 Standard Test Methods

6.2.1 标准充电 Standard Charge

除有特殊说明外，标准充电方式：以 0.5C(1300mA)恒流充电至 4.20V，转恒压充电至截止条件(电流 52mA)。

Unless otherwise specified, “Standard Charge” shall consist of charging at

constant current of 0.5C(1300mA). The cell shall then be charged at constant voltage of 4.2V while tapering the charge current. Charging shall be terminated when the charging current has tapered to 52mA. For test purposes, charging shall be performed at 25 ± 2℃.

6.2.2 标准放电 Standard Discharge

除有特殊说明外，标准放电方式：以 0.2C(520mA)恒流放电至 2.75V。

"Standard Discharge" shall consist of discharging at a constant current of 0.2C(520mA) to 2.75V. Discharging is to be performed at 25± 2℃ unless otherwise noted (such as capacity versus temperature).

6.2.3 循环测试 Cycle test

以 0.5C 恒流充电至 4.15V，转恒压充电至截止电流 0.05C；休息 10 分钟；以 1.0C 恒流放电至 3.0V；休息 10 分钟。

Cells shall be charged at constant current of 0.5C to 4.15V with end current of 0.05C. Cells shall be discharged at constant current of 1.0C to 3.0V. Cells are to rest 10 minutes after charge and 10 minutes after discharge.

6.3 测量仪器 Measuring Equipment

6.3.1 电压表 Voltmeter

内阻>1000Ω/V ， Inner impedance>1000Ω/V.

6.3.2 电流表 Ampere-meter

总外阻抗（安培表和线路）<0.01Ω。

Total external resistance(ammeter and wire)<0.01Ω.

6.3.3 卡尺 Caliper

卡尺精度为 0.02mm; The caliper should have a scale of 0.02mm.

6.3.4 内阻测试仪 ACR Meter

在 1kHz 交流条件下进行内阻测试。

The impedance meter should be operated at AC 1kHz.

7. 性能规格 Performance specification

7.1 电性能 Electrical specification

项目 Item	条件 Condition	规格 Specification
7.1.1 初始交流内阻 Initial AC Impedance	电芯在 6.2.1 标准充电之后以 1kHz 测量交流内阻 Cell shall be measured at 1kHz after charge per 6.2.1.	≤30mΩ

7.1.2 初始容量 Initial Capacity	电芯按照 6.2.1 充电，在一小时内按照 6.2.2 放电 Cells shall be charged per 6.2.1 and discharged per 6.2.2 within 1h after full charge.	≥2600mAh
7.1.3 循环寿命 @25℃ Cycle life @25℃	参照 6.2.3 Refer To 6.2.3	500 次循环保持初始容量的 90%或以上；500cycles ≥90% of Initial Capacity. 或者 1000 次循环保持容量的 80%或以上；Or 1000cycles ≥ 80% of Initial Capacity
7.1.4 不同温度下的放电容量 Discharge Capacity under different temperature	按 6.2.1 充满电后，分别搁置在-20℃、0℃、25℃中放置不低于 24h，在 40℃、55℃放置 5 小时，以 0.2C 放电至 2.75V(-20℃放电至 2.2V）。 After being charged per 6.2.1, respectively, set at -20℃, 0℃, 25℃ placed no less than 24h, at 40 ℃ , 55 ℃ for 5 hours, discharge at 0.2C to 2.75V (-20℃ discharge to 2.2V).	放电容量/额定容量 Discharge capacity / nominal capacity -20℃ ≥ 70% 0℃ ≥ 80% 25℃ ≥ 98% 40℃ ≥ 96% 55℃ ≥ 95%
7.1.5 倍率放电性能 Discharge Rate Characteristics	在 6.1 规定的环境温度下，以 6.2.1 充电后静置 10min，然后分别采用 0.5C、1C、2C、3C 不同放电倍率下恒流放电至 2.75V，记录电池容量。 Under the condition per 6.1, charge the cell per 6.2.1, rest 10min, respectively discharge at 0.5C, 1C, 2C, 3C to 2.75V, record capacity.	放电容量/额定容量 Discharge capacity / Nominal capacity 0.5C ≥ 97% 1C ≥ 95% 2C ≥ 93% 3C ≥ 90%
7.1.6 倍率充电性能 Charge Rate Characteristics	在 6.1 规定的测试环境下，分别以 0.5C、1C、 2 C 将电芯恒流充电至 4.2V，转恒压充电至电流小于 0.02C，静置 10min，1C 恒流放电至 2.75V。 Under the condition per 6.1, respectively charge the cell at 0.5C,1C, 2C CV to 4.2V cut off at 0.02C, rest 10min, discharge at 1C to 2.75V, record capacity.	0.5C 充电容量≥98%额定容量 1C 充电容量≥90%额定容量 2C 充电容量≥80%额定容量 0.5C Charging capacity ≥ 98% of Initial capacity 1C Charging capacity ≥100% of Initial capacity 2C Charging capacity ≥96% of Initial capacity

7.2 环境性能 Environmental specification

项目 Item	条件 Condition	规格 Specification
7.2.1 常温荷电保持能力 Storage Characteristics	按照 6.2.1 及 6.2.2 测试电芯初始容量，然后按照 6.2.1 进行充电，室温下开路放置 28 天，然后按照 6.2.2 测试其剩余容量；按照 6.2.1 及 6.2.2 测试电芯的恢复容量。 Initial capacity was got according to 6.2.1 and 6.2.2, then charge the cell per 6.2.1, store it under room temperature for 28 days, then check its remaining capacity per 6.2.2; test its recovery capacity according to 6.2.1 and 6.2.2.	剩余容量≥初始容量*95% 恢复容量≥初始容量*98% Remaining capacity ≥95% of Initial capacity Recovery capacity ≥98% of Initial capacity
7.2.2 高温荷电保持能力 High temperature storage characteristics	按照 6.2.1 及 6.2.2 测试电芯初始容量，然后按照 6.2.1 进行充电，55℃下开路放置 7 天，然后按照 6.2.2 测试其剩余容量；按照 6.2.1 及 6.2.2 测试电芯的恢复容量。 Initial capacity was got according to 6.2.1 and 6.2.2, then charge the cell per 6.2.1, store it under 55℃ for 7 days, then check its remaining capacity per 6.2.2; test its recovery capacity according to 6.2.1 and 6.2.2.	剩余容量≥初始容量*85% 恢复容量≥初始容量*90% Remaining capacity ≥ 85% Initial capacity Recovery capacity ≥ 90% Initial capacity
7.2.3 高温贮存 High temperature storage	按照 6.2.1 及 6.2.2 测试电芯初始容量，按照 6.2.1 充电，在室温下以 1C 电流放电 30min，然后在 45±2℃下储存 28 天，常温静置 5h，然后以 1C 标准放电至 2.75V。再按照 6.2.1 充电，常温下以 1C 电流放电至 2.75V，得到恢复容量。 Initial capacity was got according to 6.2.1 and 6.2.2, charge the cell per 6.2.1, discharge at 1C for 30min at RT, then store it under 45±2℃ for 28 days. Put it under RT for 5h, discharge at 1C to 2.75V, get the recovery capacity.	恢复容量≥初始标称容量*90% Recovery capacity ≥90% Initial capacity

7.3 机械性能 Mechanical Specification

项目 Item	条件 Condition	规格 Specification
7.3.1 跌落测试 Drop test	电池按 6.2.1 充满电，从 1.5m 高度上跌落到水平面上 30mm 厚胶木板上，分别正极朝下跌落、负极朝下跌落、水平方向跌落各两次。 Cells charged per 6.2.1 are dropped onto an oak board from 1.5 meter height for 1 cycle, 2 drops from each cell terminal and 2 drops from side of cell. (Total number of drops =4).	不爆炸、不起火、不漏液 No explosion, No fire, No leakage
7.3.2 振动测试 Vibration test	电池按 6.2.1 充满电，紧固在振动台上，按以下振动参数进行试验。振动频率在 10-55Hz 范围内以 1Hz/min 的速率变化，在 90-100min 内恢复回来,电池沿 3 个相互垂直的方向振动，对于只有两个轴向的电池，电池应沿垂直于每个轴的方向测试. Cells charged per 6.2.1 are vibrated for 90 minutes per each of the three mutually perpendicular axes (x, y, z) with total excursion of 0.8mm, frequency of 10Hz to 55Hz and sweep of 1Hz change per minute.	不爆炸、不起火、不漏液 No explosion, No fire, No leakage

7.4 安全性能 Safety specification

项目 Item	条件 Condition	规格 Specification
7.4.1 过放电 Over discharge	电芯依照 6.2.1 充满电，以 1.0C 电流放电 90min，观察 1h。 Cells charged per 6.2.1 are discharged at constant current of 1.0C for 90min, observe for 1h.	不爆炸、不起火、不漏液 No explosion, No fire, No leakage
7.4.2 过充电 Over Charge	电芯依照 6.2.1 充电，以 1.0C 电流充电至电压 6.3V 或充电时间达到 1h 后停止充电，观察 1h。。 Cells charged per 6.2.1 are charged at constant current of 1.0C until 6.3V or for 1h, observe for 1h.	不爆炸、不起火 No explosion, No fire
7.4.3 短路 External short	电芯依照 6.2.1 充电，将充电后的电池以小于 5mΩ的电阻将正、负极端短路 10 分钟；观察 1h。 Cells charged per 6.2.1 are	不爆炸、不起火 No explosion, No fire

7.4.3 短路 External short	externally shorted by wire with less than 5mΩ load for 10min, observe for 1h.	不爆炸、不起火 No explosion, No fire
7.4.4 加热 Heating test	电芯依照 6.2.1 充电，将电芯放入温度箱；温度箱按照 5℃/min 的速率由室温升至 130℃±2℃，并保持此温度 30min 后停止加热；观察 1h。 Cells are charged per 6.2.1 and heated in a circulating air oven at a rate of 5℃ per minute to 130℃. At 130°C, oven is to remain for 30 minutes before test is discontinued; observe for 1h.	不爆炸、不起火 No explosion, No fire
7.4.5.挤压 Crush	电池依照 6.2.1 充电，平放于挤压装置上，用最大 200KN 的力进行挤压，压力达到最大值后立即释放；观察 1h。 Cells charged per 6.2.1 are crushed with their longitudinal axis parallel to the flat surface of the crushing apparatus; observe for 1h.	不爆炸、不起火 No explosion, No fire
7.4.6 海水浸泡	电池依照 6.2.1 充电,将电芯浸入 3.5%NaCl 溶液（质量分数，模拟常温下的海水成分）中 2h，水深应完全没过单体蓄电池；取出，观察 1h。 Cells charged per 6.2.1 are emerged into NaCl solution(concentration 3.5%) for 2h; observe for 1h.	不爆炸、不起火 No explosion, No fire
7.4.7 温度循环 Temperature shock	电芯依照 6.2.1 充电，将电芯放入温度冲击箱，依照以下条件循环测试 5 次：-40℃(3.5h) →25℃(3.5h) → 85℃(6.83h) →25℃(8h)，观察 1h。 Cells charged per 6.2.1 are put into the test chamber, undergoing the following test procedure for 5 cycles: -40℃(3.5h) →25℃(3.5h) →85℃ (6.83h) →25℃(8h), observe for 1h.	不爆炸、不起火 No explosion, No fire
7.4.8 低气压 Low air pressure	电芯依照 6.2.1 充电，将电芯放入低气压箱中，调节试验箱中气压为 11.6kPa，温度为室温，静置 6h；观察 1 小时。 Cells charged per 6.2.1 are put into the test chamber, adjust the pressure to 11.6kPa for 6h, RT, observe for 1h.	不爆炸、不起火、不漏液 No explosion, No fire, No leakage

8.质量保证 Quality assurance

电芯正常使用 3 个月内，经确认出现任何制程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，非制程原因而是客户误用造成的电芯质量问题，不承诺免费更换。

Cells are guaranteed to be free from defects in workmanship and materials for a period of 3 month provided that the manufacturer can confirm such defects are coming from manufacturing abnormality and not from abusive usage, or else manufacturer will solve the quality problem. Dynabat 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.

9. 储存与运输 Storage and Transportation

9.1 储存电压为 3.6-3.7V，建议每 3 个月充放电一次。

It is recommended to charge and discharge once every 3 months.

9.2 电池在运输过程中约为 40%充电状态，就避免挤压、日晒和浸湿。

It is recommended to avoid being smashed, sun shined or water deluge.

电芯使用时警告和禁止操作

Handling precaution and prohibitions of lithium ion rechargeable cells

非正确使用锂离子电芯可能导致漏液、发热、冒烟、爆炸或起火。

Inaccurate handling of lithium ion cell may cause leakage, heat, smoke, an explosion, or fire.

这些可能导致性能下降或失效。请确认咨询遵照以下指示。

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

存储 Storage

建议将电芯存放在室温环境下 25±5℃，低湿、无尘、无腐蚀性气体。

Store the cells at room temperature (25±5° C) is recommended, low humidity, no dust and no corrosive gas atmosphere.

安全警告和禁止 Safety precaution and prohibitions

为了确保产品安全，以下描述了使用注意警告事项。

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

[危险！Danger！]

■ 电性能误用 Electrical misusage

使用指定的充电器。

Use dedicated charger.

使用或充电仅在指定的应用中。

Use or charge the battery only in the dedicated application.

禁止使用插线板或点烟器直接充电。

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

禁止反充电。Don't charge the battery reversely.

■ 环境误用 Environmental misusage

禁止将电芯接近火源或热源。

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

禁止将电芯扔进火中。

Don't throw the battery into the fire.

禁止在温度超过 60℃的环境中使用操作电芯。

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

禁止将电芯浸入、扔进海水或水中。

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

■ 其他 others

禁止将电芯与金属类物品一起放在包中，如钥匙、项链、发卡、硬币或螺丝。

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

禁止使用金属将电芯正负极直接短路。

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

禁止使用尖锐物品刺穿电芯，如针、电钻等。

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

禁止加热电芯，如使用焊铁头。

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

禁止使用重物打击电池，如锤子。

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

禁止踩踏电芯或扔抛电芯。

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

禁止拆解电芯。

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

禁止使用变形严重的电芯。

Don't use seriously scared or deformed battery.

禁止将电芯置于微波炉、干燥器、或高压箱内。

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

禁止使用或组装电芯与其他制造商电芯混用。

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.

禁止使用或组装新旧电芯混用。

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

[警告！Warning!]

停止充电，当充电未在设定时间内完成时。

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

停止使用电芯，当在使用、充电或存储过程中，发现电池异常发热、变色、变形等异常出现时。

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

当漏液或电解液气味泄漏时，应远离火源。如果有液体滴到皮肤或衣服上，应尽快使用清水冲洗。

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.

如果电芯内部液体进入眼睛，请不要揉眼睛，请立即使用清水冲洗并去医院。

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.

如果电芯端子变脏，在使用前，请使用干布擦去灰尘。

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

[警示！Caution!]

■ 电性能误用 Electrical misusage

电芯必须使用恒流恒压的充电方式。

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

充电电流必须遵照规格书要求。

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

截止电压必须是 4.20V。

Cut-off Voltage of charging must be 4.20V

充电器必须停止充电，当探测到充电时间或电流达到规格书要求时。

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

放电电流必须遵照规格书要求。

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

放电截止电压必须是 2.75V。

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

■ 其他 others

将电芯远离婴儿和儿童，防止吞食。

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

如果儿童使用电芯，其监护人应在使用前进行指导使用方法和注意事项。

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

在使用前，确保阅读了使用说明和注意事项。

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

■ 运输注意 Quarantine

包装若被挤压、刺破、或撕开露出内部，请停止运输。

Packages that are crushed, punctured or torn open to reveal contents should not be transported.

受损的包装应该被隔离，运输商应接受咨询指导，并提供其指导书，若适用时，安排其进行检查和再次包装。

Such packages should be isolated until the shipper has been consulted, provided instructions and, if appropriate, arranged to have the product inspected and repacked.

■ 溢出产品 Spilled Product

当包装受损时，溢出的电芯应该被收集并隔离，运输商应联系厂家要求处置指导。

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.