



PRODUCT SPECIFICATION

DOC NO.: **DF000**
REV. : **A00**
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Specification Approval Sheet

产品规格确认书

Customer Name 客户名称:

Customer Model 客户型号: **18650 USB 充电**

Product Model 产品型号: **LG 18650-3350mAh
3.63V 3350mAh 12.16Wh**

REC P/N 编号: **DF18USBCF-LG3400**

Prepared by 制作	Checked by 审核	Approved by 批准

Customer Approved 客户承认 (Stamp) (盖章)	TEST by 制作	Checked by 审核	Approved by 批准

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History of specification

规格书修订记录

Date 日期	Contents 内容	Remarks 备注
2018-02-02	First issue 初版发行	A00 版

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1. Scope 适用范围

This specification describes the technical parameters and requirement of Li-polymer battery manufactured by SHENZHEN ORIENTAL VISION BATTERY CO.,LTD.The product is ROHS compliant.

本规格书适用于深圳市东方芯愿新能源有限公司生产的可充电锂离子电池，产品满足 ROHS 要求.

2. Reference Standard 参考标准

The standard refer to GB 31241-2014、IEC62133 and the other technology standard.

本标准参考 GB31241-2014、IEC62133 等技术标准规范编制而成.

3. Picture of battery 电池图

3.1 Picture of single cell 单体电芯图



尺寸(包括热缩外套)

Dimension (Including shrink sleeve/label)

直径 (Diameter), d ----- Max. 18.4 mm

高度 (Height), h ----- Max. 65.2 mm

Fig. (1) The Dimension of Single Cell

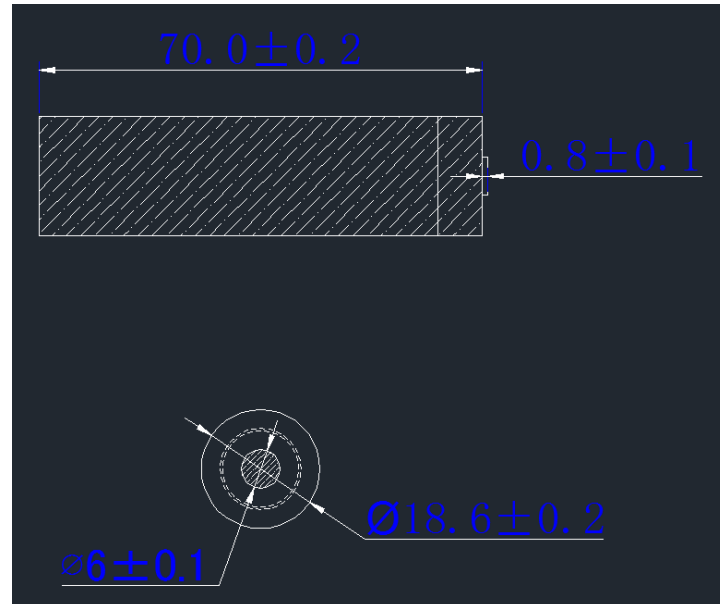
图(1) 单体电池尺寸图

3.2 Picture of assembled battery 组合电池图

3.2.1 Coding Requirements 喷码要求: /

3.2.2 Assembly Drawing 外形尺寸及线材要求图:

组合尺寸: 70mm*18.6mm



3.2.3 product label 产品标签

N/A

4. Basic of performance 基本性能

4.1 Single cell parameters 单体电芯参数

No.	Item 项目	Specification 性能	
1	Rated Capacity 额定容量	3350mAh ,0.2 C discharging	
2	Minimum Capacity 最小容量	3250mAh ,0.2 C discharging	
3	Normal Voltage 标称电压	3.63V	
4	O.C.V 出厂电压	3.60~3.90V	
5	Charge Ending Voltage (End current) 充电截止电压 (截止电流)	4.20V (32mA)	
6	Discharge Ending Voltage 放电截止电压	2.5V	
7	Standard charging method 标准充电方式	24±2.5℃ 0.3C (975mA) constant current charge to 4.2V, then constant voltage 4.2V charge till charged current declines to ≤ 0.01C(32mA)	
8	Max Charge current 最大充电电流	Rapid charge:0.5C	
9	charging Time 充电时间	Standard charge:5.5~6.5 h	
		Rapid charge: 2.5~3.0 h	
10	Standard discharging Current 标准放电电流	24±2.5℃ 0.2C(650mA) constant current discharge to 2.5V.	
11	Max.Discharging Current 最大放电电流	1.5C (4875mA) 5℃≤T≤45℃	
12	Maximum pulse discharge current 最大脉冲电流	/	
13	Operating environment 工作环境	Charging: 0℃~ 45℃, 65%±25%RH Discharging: -20℃~ +50℃, 65%±25%RH	
14	Cell Impedance 单电芯内阻	≤70mΩ, (AC 1KHz measured PTC)	
15	Dimension of Single Cell 单电芯尺寸	Diameter	18.2 +0.2/-0mm
		Height	65.0±0.2 mm

4.2 Product basic information 产品基本信息

序号	Item 项目	Specification 性能
1	Assembled Mode 组合方式	单支 18650+保护板+USB 充电
2	Normal Capacity 标称容量	3350mAh,0.2 C discharging
3	Minimum Capacity 最小容量	3250mAh,0.2 C discharging
4	Normal Voltage 标称电压	3.6V
5	Impedance 成品内阻	<120mohm, (50% charge AC 1KHz measured)
6	Charge Ending Voltage 充电截止电压	4.20V
7	Discharge Ending Voltage 放电截止电压	2.50V
8	Standard charging method 标准充电方式 CC&CV	24±2.5℃ 0.3C (975mA) constant current charge to 4.2V, then constant voltage 4.2V charge till charged current declines to ≤ 0.01C(32mA)
9	Charge current 充电电流	Standard charge:975mA
		Rapid charge:1625mA
10	Charging Time 充电时间	Standard charge:5.5~6.5 h
		Rapid charge: 1.5~2 h
11	Standard discharging Current 标准放电电流 CC	24±2.5℃ 0.2C(650mA) constant current discharge to 2.50V.
12	MAX Discharging Current 最大放电电流	Max discharge 1.5C (4875mA)
13	USB charge voltage current USB 充电电压、电流	5.0V±0.2V 600MA±100MA
14	Connector definition 接口定义	正极镀金/负极底部五金

5. Electrical Characteristics 电性能

5.1 Normal Test Conditions 标准测试条件

Temperature: $24 \pm 2.5^{\circ}\text{C}$

Relative Humidity: 45-85%RH

Atmospheric pressure: 86 -106 KPa

除非另有规定，本规格书中的各项测试应在标准大气条件下进行：

温度： $24 \pm 2.5^{\circ}\text{C}$

相对湿度：45-85%RH

大气压力：86 ~106 KPa

5.2 Rated capacity: 标称容量：

Rated capacity $\text{Cap}=3350\text{mAh}$. Under $24 \pm 2.5^{\circ}\text{C}$, the capacity obtained when a cell is discharged at 5-hours rate to voltage 2.5 V, which is signed Cap, the unit is mAh.。

标称容量 $\text{Cap}=3350\text{mAh}$ ，指在 $24 \pm 2.5^{\circ}\text{C}$ 环境下，以 5 小时率放电至终止电压 2.5V 时的容量，以 Cap 表示，单位为毫安培时(mAh)。

5.3 Standard charge method 标准充电方式：

Under $24 \pm 2.5^{\circ}\text{C}$, it can be charged to 4.2V with constant current of 0.3C, and then, charged continuously with constant voltage of 4.2V until the charged current is 0.01C.

指在 $24 \pm 2.5^{\circ}\text{C}$ 环境下，以 0.3C 的电流恒流充电至单体电芯电压 4.2 V 后，转为恒压 4.2 V 充电，至充电电流小于 0.01C 时，停止充电。

5.4 Standard discharge method: 标准放电方式：

Under $24 \pm 2.5^{\circ}\text{C}$, it can be discharged to 2.5 V with constant current of 0.2C.

指在 $25 \pm 2.5^{\circ}\text{C}$ 环境下，以 0.2C 的电流恒流放电至单体电芯电压 2.5 V。

5.5 Electrochemical Characteristics 电化学特性

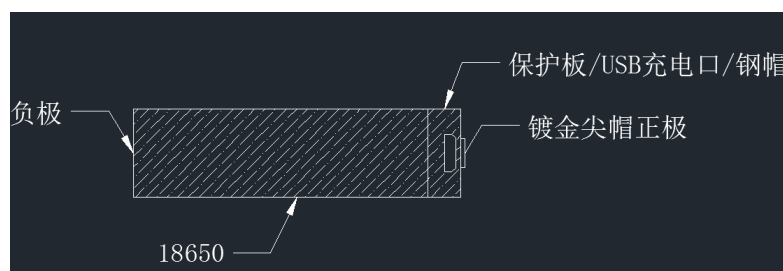
NO. 序号	Item 项目	Criterion 性能标准	Test Method 测试方法	
1	Discharge rate capability 倍率放电性能	Discharge capacity/Nominal capacity×100% 放电容量/标称容量×100% 0.5C ₅ A≥95% 1C ₅ A≥90% 1.5C ₅ A≥75%	Standard charge, then rest for 10min and discharge at 0.5 C ₅ A、1C ₅ A、1.5C ₅ A to 2.5V respectively. 电池标准充电后, 搁置10min, 然后以0.5C ₅ A、1C ₅ A、1.5C ₅ A 放电至 2.5V。	
2	Cycle life 循环寿命	The cycle times is not less than 301 循环次数不小于 301 次	The cell is charged at 0.3 C ₅ A, and discharged at a constant current of 0.5C ₅ A, then stored 30min. After 301 chargedischarge cycles the residual discharge capacity is above 75% of nominal capacity. 将电池进行0.3C ₅ A 充电、0.5C ₅ A 放电循环 301 次, 电池残余容量≥75%*标称容量。	
3	Discharge temperature Characteristics 放电温度特性	50℃	95%	Capacity comparison at each temperature, measured with discharge constant current 0.2C and 2.5V cutoff after the standard charge is as follows 采用标准充电制式后, 按电流0.2C, 限制电压2.5V在不同温度下放电, 检测出容量
		24℃	100%	
		0℃	75%	
		-10℃	70%	
		-20℃	/	
4	Normal Temperature Storage 常温荷电保持能力	Residual capacity≥ Nominal capacity×85% Resume capacity≥ Nominal capacity×90% 剩余容量≥标称容量×85% 恢复容量≥标称容量×90%	Store for 28days after standard charge, then discharge at 0.2C ₅ A to 2.5V measuring residual capacity; Then standard charge/discharge cycle for 3 times to obtain the recoverable capacity. 电池标准充电后, 开路放置28 天, 然后0.2C ₅ A 标准放电至2.5V。再以标准充放电测试电池的恢复容量, 可循环三次, 任一次容量达到标准要求, 试验即可停止。	

6. PCM Specification PCM 规格

6.1 Electrical Characteristics 电性能

Item 项目	Symbol 符号	Content 详细内容	Criterion 标准
Over charge Protection 过充保护	V_{DET1}	Over charge detection voltage 过充电检测电压	$4.30 \pm 0.05V$
	tV_{DET1}	Over charge detection delay time 过充电检测延迟时间	300ms Max
	V_{REL1}	Over charge release voltage 过电解除电压	$4.1 \pm 0.05V$
Over discharge protection 过放保护	V_{DET2}	Over discharge detection voltage 过放电检测电压	$2.40 \pm 0.1V$
	tV_{DET2}	Over discharge detection delay time 过放电检测延迟时间	140ms Max
	V_{REL2}	Over discharge release voltage 过电解除电压	$3.00 \pm 0.1V$
		额定放电电流	$\leq 4A$
Over current protection 过流保护	V_{DET3}	Over current detection voltage 过电流检测电压	$0.15 \pm 0.015V$
	I_{DP}	Over current detection current 过电流保护电流	$6A \pm 1A$
	tV_{DET3}	Detection delay time 检测延迟时间 1	12ms Max
		Release condition 保护解除条件	Cut load 断开负载
Short protection 短路保护		Detection condition 保护条件	Exterior short circuit 外部电路短路
		Release condition 保护解除条件	Cut short circuit 断开短路电路
Interior resistance 内阻	R_{DS}	Main loop electrify resistance 主回路通态电阻	$V_C=4.2V, R_{DS} \leq 30m\Omega$
充电		充电电压电流	$5.0 \pm 0.1V / 700 \pm 100MA$
Current consumption 消耗电流	I_{DD}	Current consume in normal operation 工作时电路内部消耗	$\leq 40\mu A$

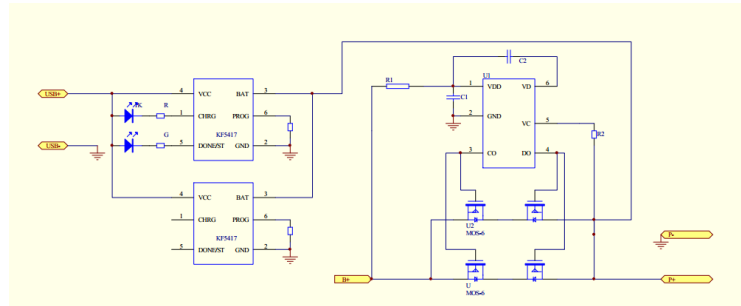
6.2 Wiring diagram 接线图/接线端



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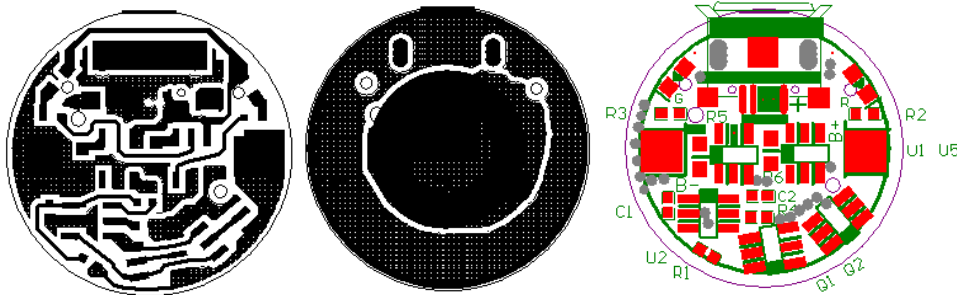
6.3 Schematic circuit diagram 电路原理图



6.4 PCM Key components 保护板主要元件

序号	名称	位号	规格	用量	供应商	备注
1	IC	U1 U3	KF5417 (57BX))	2		KF
2	IC	U2	8036	1		SI
3	IC	U5U6	PG511	2		
6	USB		MIC-5P	1		
7	灯		红绿各一个	2		
8	五金			1		
9	线路板	PCB	17.4*17.4*0.6mm	1		

6.5 PCB Layout PCB 布线图



7. Storage and Shipment Requirement 存储及运输要求

Item 项目	Requirement 要求
Short period less than 1 month 短期少于 1 个月	-10°C ~ +50°C, 65%±25%RH
Long period more than 3 month 长期超过 3 个月	0~+35°C, 65%±25%RH
Recommend storage 推荐存储	23±5°C, 65%±5%RH
Long time storage :	
If the cell is stored for a long time, the cell's storage voltage should be 3.8-4.0V .Also, it is recommended to charge the cell every three months.	

7.1 packaging 包装

The other outside the package indicate the product name, model, quantity, manufacturer, production date,

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"Handle with care", "keep dry", "up", etc.

包装箱外标明产品名称、型号、数量、制造厂商、出厂日期；有“小心轻放”、“怕湿”、“向上”等标志。

7.2 quality guarantee period 保质期

Within the warranty period because of the quality problem of the battery itself, our company will be change, such as its customers for the operating error caused by the problem, not to change.

在保质期内由于电池本身的质量问题，我公司将予以调换，如因客户自身操作失误所造成的问题，不予退换。

Any issues not covered in this specification should be discussed between the customer and our company

任何本说明书中未提及的事项，须经双方协商确定。

8. Warning and Cautions 警告及注意事项

Danger warning (it should be described in manual or instruction for users, indicated especially) to prevent the possibility of the battery from leaking, heating, explosion. Please observe the following precautions:

危险警告：（应在使用说明手册或说明书中，特别注明）为防止电池可能发生泄漏，发热，爆炸，请注意以下预防措施：

Please use 0.2C current to charge up 60% capacity after the battery placed 3 months

电池每放置三个月，请预先以 0.2C 充电 1 次，即让电池具有 60% 以上的电量

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。

Do not discard or leave the battery near a heat source as fire or heater

禁止将电池在热高温源（如火、加热器）旁等使用、留置或丢入。

Being charged, using the battery charger specifically for that purpose

充电时请选用锂离子电池专用充电器。

Don't reverse the positive and negative terminals

严禁颠倒正负极使用电池。

Don't connect the battery to an electrical outlet directly.

严禁将电池直接接入电源插座。

Don't connect the positive and negative terminal directly with metal objects such as wire.

Short terminals of battery is strictly prohibited, it may damage battery.

禁止用金属直接连接电池正负极短路，任何时候禁止短路电芯，它会导致电芯严重损坏。

Do not transport and store the battery together with metal objects such as necklaces, hairpins.

禁止将电池与金属，如发夹，项链等一起运输或贮存。

Do not strike, throw or trample the battery.

禁止敲击或抛掷，踩踏电池等。

Do not directly solder the battery and pierce the battery with a nail or other sharp object

禁止直接焊接电池和用钉子或其它利器刺穿电池。

Do not use lithium ion battery and others different lithium polymer battery model in mixture

禁止与液态锂离子或不同型号的聚合物锂电池混合使用

Prohibition of use of damaged cells

禁止使用已损坏的电芯

Don't bend or fold sealing edge. Don't open or deform folding edge Don't fillet the end of the

folding edge

禁止弯折顶封边，禁止打开或破坏折边，禁止导折电芯折边底部

Don't fall, hit, bend battery body.

禁止坠落、冲击、弯折电芯。

Battery pack designing and packing Prohibition injury batteries.

电池外壳设计和包装禁止损伤电池。

Never disassemble the cells

在任何情况下不得拆卸电芯

The battery replacement shall be done only by either cells supplier or device supplier and never be done by 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。

Keep the battery away from babies.

电池应远离小孩。

Caution 小心

◆ Do not use or leave the battery at very high temperature conditions (for example, strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it can overheat or 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）使用或放置电池，否则可能会引起电池过热，起火或功能失效，寿命减短。

◆ Do not use it in a location where is electrostatic and magnetic greatly, otherwise, the safety devices may be damaged, causing hidden trouble of safety.

禁止在强静电和强磁场的地方使用，否则易破坏电池安全保护装置，带来不安全的隐患。

◆ If the battery leaks, and the electrolyte get into the eyes. Do not wipe eyes, instead, rinse the eyes with clean running water, and immediately seek medical attention. Otherwise, eyes injury can result.

如果电池发生泄漏，电解液进入眼睛，请不要揉擦，应用清水冲洗眼睛，并立即送医治疗，否则会伤害眼睛。

◆ If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.

如果电池发出异味，发热，变色，变形或使用，贮存，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。

◆ In case the battery terminals are dirt, clean the terminals with a dry cloth before use. 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。

Prohibition of use of damaged cells

禁止使用已损坏的电芯

◆ Be aware discharged batteries may cause fire; tape the terminals to insulate them.

废弃之电池应用绝缘纸包住电极，以防起火，爆炸。



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9. Note 声明

Note (1): The customer is requested to contact in advance if and when the variations of the operating conditions described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

声明一:

客户若需要将电芯用于超出文件以外的设备,或在文件规定以外的使用条件下使用电芯,应事先联系。因为需要进行特定的实验测试以核实电芯在该使用条件下的性能及安全性。

Note (2): take no responsibility for any accident when the cell is used under conditions outside of this specification.

声明二:

对于在超出文件规定以外的条件下使用电芯而造成的任何意外事故,概不负责。

Note (3): inform the customer in writing of improvement(s) regarding proper use and handling of the cell if it is deemed necessary.

Energy reserves the right to revise this specification before the customer signs the datasheet. If a revision is required, notify the customer.

声明三:

如有必要会以书面形式告知客户有关正确操作使用电芯的改进措施。

在规格书未签确前,本公司有权对本产品规格书进行修订,如有必要修订后将会通知客户。

10. Customer Inquiry 客户要求

If clientele ratify specification and showpiece, please sign back specification to SHENZHEN ORIENTAL VISION BATTERY CO.,LTD 1week, or else blank out it.

如果客户认可规格书和样品,请于 7 天内回签规格书给深圳市东方芯愿新能源有限公司,过期视为无效。

The customer is requested to write down your information and contact SHENZHEN ORIENTAL VISION BATTERY CO.,LTD advance, if and when the customer needs applications or operation conditions other than those described in this document. SHENZHEN ORIENTAL VISION BATTERY CO.,LTD design and build such products according to your special request.

如果客户需要其它方面的说明或工作条件与规格书内容不一致,请客户提前和深圳市东方芯愿新能源有限公司联系,深圳市东方芯愿新能源有限公司将按照贵公司特殊要求设计和开发产品的特殊要求标准。

序号 NO	特殊要求 Special Request	标准 Standard
1		
2		

制造商保留在没有预先通知的情况下改变和修正设计及规格说明书的权力

Manufacturer reserve the right to alter or amend the design, model and specification without prior notice