

1. Scope/适用范围

This specification describes the technical performance and notice of IFR18650-1500mAh batteries, supplied by CEBA

本规格书描述了磷酸铁锂电池 IFR18650-1400mAh 的有关技术指标及使用注意事项，由 CEBA 电池公司提供

2. Specification/基本特性

No. 序号	Item 项目	General parameter 常规参数	Remark 备注
1	Can Material 壳体材质	Ni-plate Steel 镀镍钢壳	
2	Nominal capacity 标称容量	1400mAh	0.2C ₅ A
3	Minimum capacity 最小容量	1350mAh	0.2C ₅ A
4	Nominal voltage 标称电压	3.2V	
5	Maximum charge voltage 充电最高电压	3.65V	
6	Discharge cut-off voltage 放电截止电压	2.5V	
7	Maximum continuous charge current 最大持续充电电流	1 C ₅ A	
8	Maximum continuous discharge current 最大持续放电电流	3 C ₅ A (时间>15min)	脉冲放电电流: 10A, 10s
9	Internal impedance 内阻	<45mΩ	Measured at AC1KHz of 50% DOD 半电态下交流 1KHz 测量
10	Battery weight 电池重量	Approx.42g 约 42g	盖帽直径 (d1) : 8±0.1mm
11	Battery diameter (d) 电池直径	18.2±0.1mm	

3. Battery Performance / 电池性能

3.1 Electric Performance/电性

No. 序号	Test Item 检测项目	Test Method 测试方法	Test Standard 检测标准
1	Normal temperature discharge performance 常温放电性能	Standard charge, then rest for 10min and discharge at 0.2 C ₅ A、 0.5C ₅ A、 1C ₅ A to 2.5V respectively. 电池标准充电后, 搁置 10min, 然后以 0.2C ₅ A、 0.5C ₅ A、 1C ₅ A 放电至 2.5V	Discharge capacity/Nominal capacity×100% 放电容量/标称容量×100% 0.2C ₅ A≥100%
2	Normal Temperature Storage 常温荷电保持能力	Store for 28days after standard charge, then discharge at 0.5C ₅ A to 2.5V measuring residual capacity; Then standard charge/discharge cycle for 3 times to obtain the recoverable capacity. (the same below) . 电池标准充电后, 开路放置 28 天, 然后标准放电至 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。	Residual capacity≥Nominal capacity×95% 剩余容量≥标称容量×95%
3	Cycle Life 循环寿命	After 2000 cycles in 100% DOD charge and discharge at 1C ₅ A current, the residual discharge capacity is above 80% of nominal capacity. 将电池进行 1 C ₅ A 充放电循环 2000 次, 电池残余容量≥80%*标称容量。	≥2000 cycles

Remark: Measurements are carried out at normal atmospheric pressure、 ambient temperature 25±5℃ and relative humidity of 60±25% without other specified condition. Accuracy of voltmeters and ammeters used in test is equal to or better than the grade 0.5.

注: 如没有特殊要求测试应在 1 标准大气压、环境温度 25±5℃、相对湿度 60±25% 条件下进行, 测试中所使用的电压表和电流表的精度等级≤0.5。

3.2 Safety Performance/安全性

No. 序号	Test Item 检测项目	Test Method 测试方法	Standard 检测标准
1	Overcharge 过充电	Charge at 3C ₅ A constant current to 10.0V. 电池以3C ₅ A 电流充电, 充电电压限制10V	No fire、No explosion 不起火、不爆炸
2	Over discharge 过放电	Standard discharged ,then discharge at 0.1C ₅ A constant current to 0V. 电池标准充电后, 以0.1C ₅ A 电流放电至电压为0.	No fire、No explosion 不起火、不爆炸
3	External Short-circuit 外部短路	After standard charge, short-circuit the cell by connecting the positive and negative terminals of the cell directly with Cu wire with a resistance less than 0.1Ω for 1h. 电池标准充电后, 直接短路电池正负极 1 小时, 线路总电阻不超过0.1Ω	No fire、No explosion,the cell surface-temperature is less than150℃. 不起火、不爆炸, 电池表面温度不超过150℃
4	Impact 重物冲击	After standard charge,cells are impacted with their longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm diameter bar.The hammer of 9.1Kg is to be dropped from a height of 610mm onto the bar. 电池标准充电后, 将一直径15.8mm 的金属棒平放在电池最大平面中心, 金属棒的中心轴与电池高度方向垂直。将 9.1kg 的重物从610mm 高度自由垂落冲击金属棒。	No fire、No explosion 不起火、不爆炸
5	Crush 挤压	After standard charge,Cells are crushed with their longitudinal axis parallel to the flat surface of the crushing apparatus.The crushing is to be inued until a pressure reached to 13KN.Once the maximum pressure has been obtained it is to be released. 电池标准充电后, 平放于挤压装置上, 用最大13KN 的力进行挤压, 压力达到最大值后立即释放。	No fire、No explosion 不起火、不爆炸
6	Hot oven 热冲击	After standard charge,Cells are heated in a circulating air oven at a rate of 5±2℃ per minute to 130±2℃ and remained for 10 minutes. 电池标准充电后, 放置于空气流通的热箱中, 温度以 (5±2℃) /min 的速率升至 130℃ ±2℃ 并保持10min。	No fire、No explosion 不起火、不爆炸

3.3 Environmental tests/环境适应性

No. 序号	Test Item 检测项目	Test Method 测试方法	Standard 检测标准
1	Temperature Cycle 高低温循环	After standard charge, Cells are stored at $75\pm 2^{\circ}\text{C}$ for 48h, then $-20\pm 2^{\circ}\text{C}$ for 6h and room temperature for 24h. Then standard charge/discharge cycle for 5 times to obtain the recoverable capacity. 电池标准充电后, 在 $75\pm 2^{\circ}\text{C}$ 环境下搁置 48h, 放在 $-20\pm 2^{\circ}\text{C}$ 环境中 6h, 再在室温环境搁置 24h。然后将电池进行标准充放电循环 5 次测试恢复容量	Recoverable capacity \geq Nominal capacity $\times 70\%$ No deformation, No fire, No explosion. 恢复容量 \geq 标称容量 $\times 70\%$ 电池不变形、不起火、不爆炸
2	Drop 跌落	After standard charge, Cells are dropped from a height of 1m to wooden board in X, Y, Z directions twice respectively (total 6 times). Then discharge at 0.2C ₅ A to 2.0V. 电池标准充电后, 由 1m 高度自由跌落到木板上, 任意方向跌落 2 次 (共 6 次)。然后以 0.2C ₅ A 放电至 2.0V。	Residual capacity \geq Nominal capacity $\times 85\%$ No leakage, No fire, No explosion. 放电容量 \geq 标称容量 $\times 85\%$ 电池不漏液、不起火、不爆炸
3	Vibration 振动	After standard charge, cells are fixed on the platform and be subjected to vibrate on following frequency 10~55Hz and amplitude vibration for 30 minutes recycling rate of 1 oct/min with direction of X, Y. A. Vibration Frequency: 10~30Hz, Vibration amplitude (single swing): 0.38mm. B. Vibration Frequency: 30~55Hz, Vibration amplitude (single swing): 0.19mm. Then discharge at 0.2C ₅ A to 2.0V to obtain residual capacity. 电池标准充电后, 固定在振动台上, 沿 X、Y 方向各振动 30min, 振动频率为 10Hz~55Hz, 扫频速率为 1oct/min 位移幅值 0.38mm(10-30Hz); 0.19mm (30-55Hz) 振动后以 0.2C ₅ A 放电至 2.0V。	Residual capacity \geq Nominal capacity $\times 95\%$ No leakage, No fire, No explosion. 放电容量 \geq 标称容量 $\times 95\%$ 电池不漏液、不起火、不爆炸
4	Low pressure (altitude simulate) 低压性能 (高度模拟)	After standard charge, cells are stored under the atmosphere pressure of 11.6KPa for 6 hours. 电池标准充电后, 在 11.6kPa 气压下搁置 6h	No leakage, No fire, No explosion. 电池不漏液、不起火、不爆炸

Remark: All safety and environmental tests should be conducted by the professional under the good safeguard. Otherwise the test possibly causes damage to the test equipment or the operator.

注：如需进行上述试验，均须在良好的安全措施保护下，由专业人员进行。否则可能会对试验设备和人身造成意外伤害！

4. Warranty period and Product responsibility/保质期及产

品责任

Warranty period of this product is 1 year from leaving plant date (code).

产品保质期限为自出厂日期（喷码）开始算起 1 年内。

We will not guarantee against any accidents occurring due to usage against this specification.

我公司对因没有按本规格书规定操作而导致的意外不负责任。

5. Mark of Packaging/电池包装标识

The following notice should mark on the packaging of batteries.

以下警告应注明在包装后的电池上

Use the prescribed charger for Li-ion batteries.

- 使用规定的锂离子电池充电器

Never put batteries into fire or heat.

- 不要将电池投入火中或加热

Do not short circuit batteries.

- 不要将电池两端短路

Never disassemble batteries.

- 不要将电池分解拆散

Please read the specification carefully and according to the following to install or use the cell, as improper handling of li-ion cell may result in lose of efficiency, heating ignition, electrolyte leakage or even explosion.

请仔细阅读并遵照以下条款安装使用电池，不正确的安装使用可能会导致电池发热、鼓胀、

泄漏、冒烟或爆炸着火等。

Warning

Never put a battery into water or seawater. Store batteries in a cool dry place. 禁止

将电池浸入海水或水中, 保存不用时, 应放置于阴凉干燥的环境中。Never put

batteries into fire or heat.

禁止将电池放入火中, 或对电池加热。

Never reverse positive and negative terminals to use batteries.

严禁颠倒正负极使用电池。

Never disassemble or modify batteries.

禁止拆解电池, 请勿随意改变电池结构。

Do not short circuit the (+) and (-) terminals with other metals

禁止用金属直接连接电池正负极造成短路。

Hair-pins, coins or screws. Do not store batteries with such objects.

禁止将电池与金属物, 如发夹、硬币等一起运输或贮存。

Do not hit with a hammer, step on or throw batteries. 禁止敲

击或抛掷、踩踏电池等。

Do not solder batteries directly.

禁止直接焊接电池。

Do not penetrate batteries by nail or other tools.

禁止用钉子或其它利器刺穿电池。

Notice

If liquid leaks onto your skin or clothes, wash well with fresh water immediately.

If liquid leaking from the battery gets into your eyes, do not rub your eyes. Wash them well with

clean water and go to see a doctor immediately.

如果电池发生泄露, 电解液接触皮肤或衣物, 应立即用清水冲洗干净;

如果电解液进入眼睛, 请不要揉擦, 应立即用清水冲洗眼睛, 并及时送医院治疗。

While using, testing or reserving batteries, if you find the battery become hot, distribute smell,

change color, deform or any other abnormality, please stop using or testing immediately, and

attempt to isolate and keep away from the battery.

如果电池发出异味、发热、变色、变形或在使用、贮存、充电过程中出现任何异常, 应在有安

全防护的条件下, 立即将电池从装置或充电器中移至安全的地方并停止用。

Store batteries out of reach of children so that they are not accidentally swallowed.

把电池放到儿童接触不到的地方, 避免发生意外。

When the battery is thrown away, be sure it is non-conducting by applying insulating tape to the (+) and (-) terminals

Figure: External Dimension Drawing:
附：电池外形尺寸图示：

