EEMB BATTERY

Lithium Manganese Dioxide Battery

Specification

锂二氧化锰电池产品规格书

Button Type (扣式)

Model 型号:	**CR1632**
Capacity 容量:	**120mAh**

Prepared 编制	Checked 审核	Approved 批准

Customer 客户名称：

Customer Approval（Customer confirmation）客户确认:

Address：Room 301 , Building 2#, No.28 Changjin Road, Heao Community, Yuanshan Street, Longgang District, Shenzhen, P.R.China

Phone：+86-755-22225375

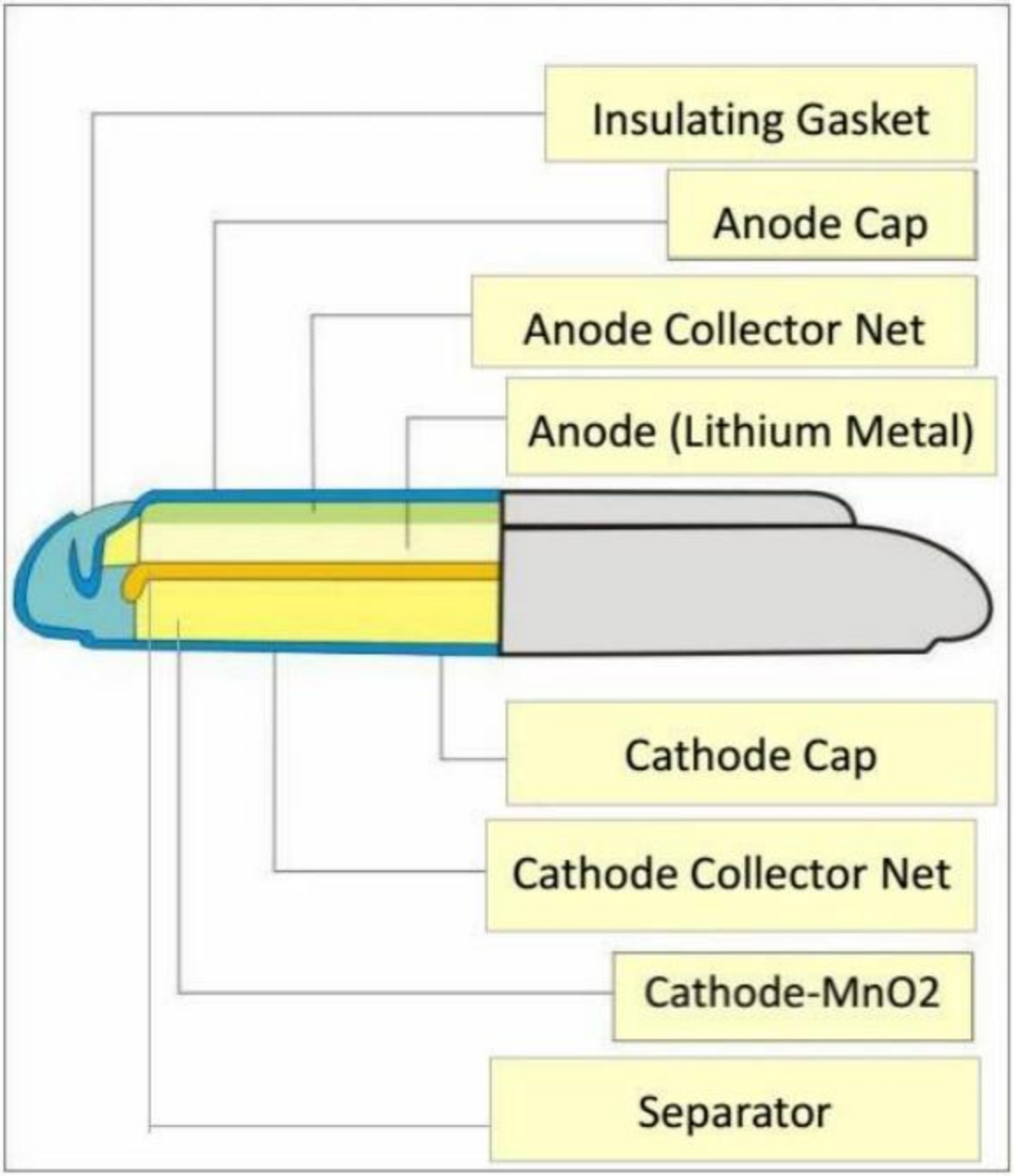
https://www.eemb.com

Capacity that battery can deliver depends on discharge load, operating temperature, and cut-off voltage. This data is subject to change. Performance information is typical.

Catalog

Chapter	Content	Page
0	Catalog	2
1	Scope	4
2	Features and Applications	4
3	Battery Basic Characteristics	5
4	Battery Shape and Dimension	5
5	Appearance	5
6	Battery Characteristics	6
7	Characteristics Curves	6-7
8	Memory Backup Circuit Design Suggestion	7
9	Warranty	7
10	Matters Needing Attention	8-12

Battery Structure 电池结构



1. Scope 适用范围

This product specification defines the requirements of the Lithium Manganese Dioxide Battery supplied to the customer by EEMB Co., Ltd.
本产品规格书适用于 EEMB 提供的锂锰二氧化物电池。

Manganese dioxide (MnO2) is used for the active cathode material, and high voltage, high activity lithium metal for the anode material. Battery discharge reactions are as follows:
二氧化锰（MnO2）用作活性正极材料，高电压，高活性锂金属用作负极材料。电池放电反应如下：

Anode reaction 负极反应: $Li \rightarrow Li + e^-$
Cathode reaction 正极反应: $MnO_2 + Li + e^- \rightarrow MnO_2Li$
Total reaction 总反应式: $MnO_2 + Li \rightarrow MnO_2Li$

2. Features and Applications 特点和应用

Features 特点:

- ✓ Light weight, high voltage and high energy density. Excellent stable discharge characteristics.
- ✓ 重量轻，高电压和高能量密度。优异的稳定放电特性。
- ✓ Outstanding temperature characteristics.
- ✓ 出色的温度特性。
- ✓ Excellent leakage resistance.
- ✓ 优异的防漏性。
- ✓ Excellent long-term reliability.
- ✓ 出色的长期可靠性。

Applications 应用:

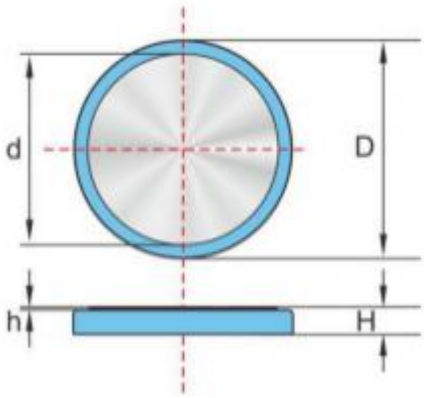
- ✓ Watches 表
- ✓ Calculators 计算器
- ✓ PC notebooks PC 笔记本
- ✓ Electronic keys 电子钥匙
- ✓ Card-type radios 卡式无线电
- ✓ IC cards IC 卡
- ✓ Memory cards 记忆卡
- ✓ Medical equipment 医疗设备
- ✓ CMOS memory backup CMOS 内存备份

3. Battery Basic Characteristics 电池产品基本特性

No.	Item 项目	Characteristics 特性	Remarks 备注
3.1	Model 型号	CR1632	
3.2	Nominal capacity 标称容量	120mAh	At 23±2℃, humidity 65±20%, discharge with load 30kΩ till 2.0V cut-off voltage. 在23±2℃，湿度 65±20%下，以负载30kΩ的标准放电至2.0V截止电压。
3.3	Nominal voltage 标称电压	3.0V	
3.4	Weight 重量	Approx约 1.6g	Unit cell 单电芯
3.5	Self-discharge rate 自放电率	≤3%	Stored for 12 months at 23±2℃, humidity 65±20% 在23±2℃，湿度 65±20%下存储12个月
3.6	Operating temperature 工作温度	-20~70℃	
3.7	Storage temperature 存储温度	0~35℃	

4. Battery Shape and Dimension（Unit：mm）

电池产品外形及尺寸（单位：mm）



Item 项目	Specification 规格
D	$16.0_{-0.3}$
H	$3.2_{-0.2}$
d	Max. 14.0
h	Max. 0.5

5. Appearance 外观

It shall be free from any defects such as remarkable scratches, breaks, cracks, discoloration, leakage, or middle deformation.

电池表面无划伤、裂纹、脏点、锈蚀、变形、变色、漏液等缺陷，中间无翘起。

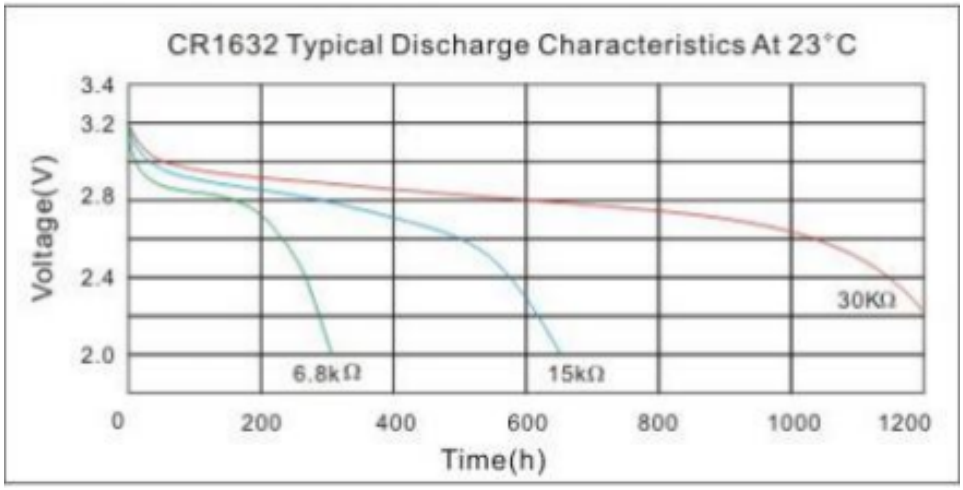
Capacity that battery can deliver depends on discharge load, operating temperature, and cut-off voltage.
This data is subject to change. Performance information is typical.

6.Battery Characteristics 电池性能

Test condition: Temperature 23±2℃, Humidity 65±20% 试验条件：23±2℃,； 湿度 65±20%

No	Item 项目	Standard 标准	Test Methods 测试方法
6.1	Capacity 容量	≥1200h	At 23±2℃, humidity 65±20%, store and keep the battery for 8 hours, then at the same condition, continuously discharge with load 30kΩ till 2.0V cut-off voltage. 在23±2℃,，湿度65±20%下放置8小时，以负载30kΩ持续放电直至2.0V终止电压。
6.2	Vibration test 振动测试	Characteristics keep stability 特性保持稳定	Put battery on the platform of the vibrations machine, start the machine and adjust the frequency form 10 times per minute to 15 times per minute. keep it running for an hour. 将电池放在振动机的平台上，启动机器并将频率从每分钟10次调整为每分钟15次。让它运行一个小时。
6.3	Over discharge Test 过放测试	No leakage allowed. 不漏液。	At 23±2℃, after 2.0V end-voltage, continuously discharged for 5 hours. 在23±2℃，2.0V终止电压后，连续放电5小时。

7.Typical Discharge Characteristics Curves 典型放电特性曲线



Initial fresh battery within 3 months 3个月以内的新电池

Capacity that battery can deliver depends on discharge load, operating temperature, and cut-off voltage. This data is subject to change. Performance information is typical.

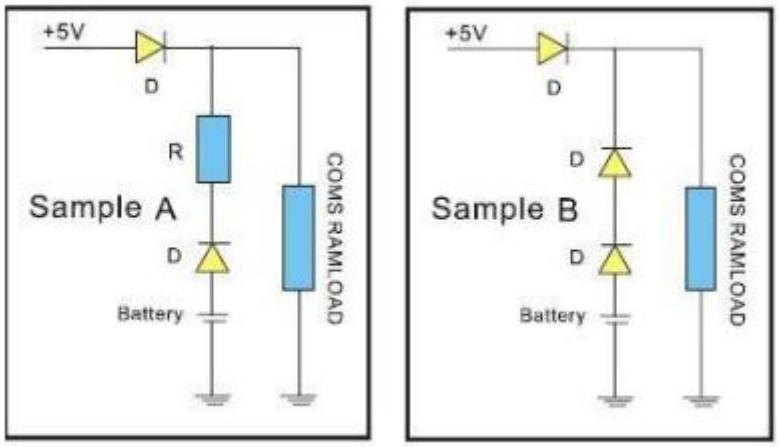
8.Memory Backup Circuit Design Suggestion 存储器备份电路设计建议

A primary lithium battery is not rechargeable, when used for memory backup in combination with another power source; current may flow into the battery from the other source. A protection diode and resistor into the circuit is needed to avoid battery charging or over discharging. Select a silicon diode or a diode with minimum leakage current, and design the circuit so that the amount of charging due to leakage current will not exceed 2% of the nominal battery capacity over the total period of use.

当用于与其他电源组合的存储器备份时，主锂电池不可再充电；电流可能从另一个电源流入电池。需要在电路中使用保护二极管和电阻器以避免电池充电或过度放电。选择具有最小漏电流的硅二极管或二极管，并设计电路，使漏电流引起的充电量不超过总使用时间内标称电池容量的 2%。

While used for memory backup, the following circuit shall be applied:

用于内存备份时，应使用以下电路：



9.Warranty 保质期

6 months warranty for sample battery after date of production. One year warranty for finished battery after the date of production.

样品电池保质期为（出厂之日起）半年；产品电池保质期为（出厂之日起）1 年。

10.Matters Needing Attention 注意事项

Strictly observes the following needing attention. EEMB will not be responsible for any accident occurred by handling outside of the precautions in this specification.

您必须严格遵守下述电池使用注意事项。对于没有按照以下注意事项所造成的任何意外事故，EEMB 不负担任何责任。

Capacity that battery can deliver depends on discharge load, operating temperature, and cut-off voltage. This data is subject to change. Performance information is typical.

! Danger 危险

- ✓ Use Nickel-plated iron or Nickel-plated stainless steel for the terminals that contact battery.
- ✓ 使用镀镍铁或镀镍不锈钢作为接触电池的端子。
- ✓ Make sure that terminal contact pressure is 50g minimum, for a stable contact.
- ✓ 保持电池和接触端子表面清洁，避免受潮和异物进入。
- ✓ Before inserting the battery, check the battery contact terminals to make sure they are normal, not bent or damaged. (Bent terminals may not make good contact with the battery or may cause short circuit.)When the batteries are piled up in a disorderly way, their positive and negative terminals may short-circuit, consuming some batteries while charging others, causing explosion.
- ✓ 在插入电池之前，请检查电池接触端子，确保它们正常，没有弯曲或损坏。（弯曲的端子可能与电池没有良好的接触或者可能导致短路。）当电池以无序的方式堆积时，它们的正极和负极可能会短路，在给其他电池充电时会消耗一些电池，从而导致爆炸。
- ✓ Do not mix batteries of different types and brands, or new and used batteries. We are well informed that battery pack should be assembled with single batteries of similar voltage, capacity and inner resistance.
- ✓ 请勿混用不同类型和品牌的电池，或新旧电池。我们充分了解电池组应使用类似电压，容量和内阻的单个电池组装。
- ✓ Lithium batteries need a period of time to recover their normal voltage after even a slight short circuit. Therefore, if the battery is short-circuited, wait an adequate long time for batteries to recover before measuring their electrical characteristics.
- ✓ 即使是轻微的短路，锂电池也需要一段时间才能恢复正常电压。因此，如果电池短路，请在测量电气特性之前等待足够长的时间让电池恢复。
- ✓ Use a high impedance (1M or higher) voltmeter to measure battery voltage.
- ✓ 使用高阻抗（1M 或更高）电压表测量电池电压。
- ✓ Add fuse between negative and connector. Once short circuit, it will cut immediately and permanently.
- ✓ 在负极和连接器之间添加保险丝 一旦短路，它将立即永久切断。
- ✓ Do not contact terminals with conductive i.e. metal, goods. Keep batteries in non-conductive, i.e. plastic, trays. Reduce impact to insulation layer from vibration, but the dimension will enlarge.
- ✓ 不要接触带导电的端子，即金属，货物。将电池放在不导电的塑料托盘中。减少振动对绝缘层的影响，但尺寸会增大。
- ✓ Battery characteristics vary with type and grade, even when batteries are the same size and shape. When replacing batteries with new ones, be sure to carefully check the symbols and numbers on them.
- ✓ 即使电池尺寸和形状相同，电池特性也会因型号和等级而异。更换新电池时，请务必仔细检查电池上的符号和数字。

! Warning 警 告

- ✓ DO NOT recharge, short-circuit, disassemble, deform, heat or place the battery near a direct flame. This battery contains flammable materials such as lithium and organic solvent and performing any of the above actions could cause it to ignite explode or become damaged.
- ✓ 请勿在直接火焰附近充电，短路，拆卸，变形，加热或放置电池。该电池含有易燃材料，如锂和有机溶剂，执行上述任何操作都可能导致其爆炸或损坏。
- ✓ DO NOT over-discharge the battery. In case the battery is over-discharged when connected with exterior power source or connected with other batteries in series, explosion may occur.
- ✓ 请勿过度放电。如果在与外部电源连接或与其他电池串联时电池过放电，可能会发生爆炸。

- ✓ Keep this battery out of the reach of children. If it is swallowed, contact a physicianimmediately.
- ✓ 请将此电池放在儿童接触不到的地方。如果被吞下，请立即联系医生。
- ✓ When storing a battery or throwing it away, be sure to cover it with tape. If the battery is contacted with other metal objects, it could cause fire or become damaged.
- ✓ 存放电池或丢弃电池时，请务必用胶带盖住电池。如果电池与其他金属物体接触，可能会引起火灾或损坏。

! Caution 注　意

- ✓ Thoroughly read the user's manual before use, inaccurate handling may cause leakage, heat, smoke, explosion, or fire, causing device trouble or injury.
- ✓ 使用前请仔细阅读用户手册，不准确的操作可能会导致泄漏，发热，冒烟，爆炸或起火，从而导致设备故障或受伤。
- ✓ Insert the battery with the "+" and "-" ends correctly oriented
- ✓ 插入电池时，“+”和“ - ”端正确定向.
- ✓ Please do not use different brands of batteries together.
- ✓ 如果电池与新电池一起使用，请勿将其与其他类型的电池一起使用。
- ✓ Do not solder the battery directly. Protect the welding point and connector.
- ✓ 不要直接焊接电池。 保护焊接点和连接器。
- ✓ The battery should be preferably stored in dry and cool conditions. Avoid storing the battery in direct sunlight, or in excessively hot and humid place. Storage at high temperature must be avoided to preserve the battery life time.
- ✓ 电池应优选储存在干燥和凉爽的条件下。 避免将电池存放在阳光直射或过热的地方。 必须避免在高温下储存，以延长电池的使用寿命。

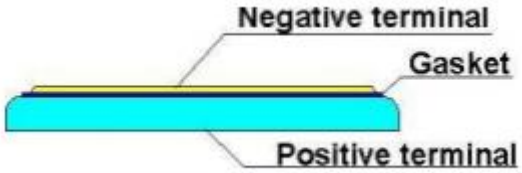
! Storage and Mount 存储和安装

The cell should be preferably stored in dry and cool conditions.
电池应优选储存在干燥和凉爽的条件下。

+60℃, 120 days stored condition is the equivalent of 6 years at room temperature (+21℃).
Button lithium batteries need special method to avoid short-circuiting before and after they are installed. As short circuits tend to occur in the following cases, please take care when handing the batteries
+ 60℃，120 天储存条件相当于室温下 6 年（+ 21℃）。
纽扣锂电池需要特殊的方法，以避免安装前后的短路。 由于在下列情况下容易发生短路，请在搬运电池时注意

✓ ***Overlapping Batteries 重叠电池***

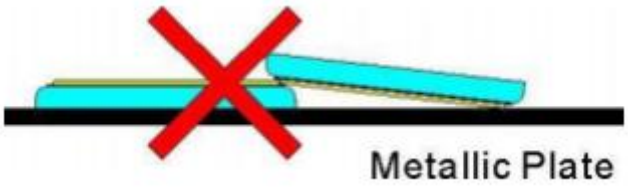
A Button lithium battery is shaped as shown below. It has exposed positive and negative metallic surfaces with a thin cylindrical seal, called the gasket, in between.
纽扣锂电池的形状如下所示。它暴露出正负金属表面，中间有一个薄的圆柱形密封，称为垫圈。



When batteries are overlapped or mixed together in a disorder way, their positive and negative terminals touch each other, causing short circuits.
当电池以无序方式重叠或混合在一起时，它们的正极和负极端子相互接触，导致短路。

✓ ***Batteries put in a Metallic Container or on a Metallic Plate 电池放在金属容器或金属板上***

Similar to the overlapping battery problem, when batteries are put in a metallic container or on a metallic plate, their positive and negative terminals may short circuit through the conductive surface depending on the placement
类似于重叠电池问题，当电池放入金属容器或金属板上时，它们的正极和负极端子可能会因导电表面而短路，这取决于放置位置。

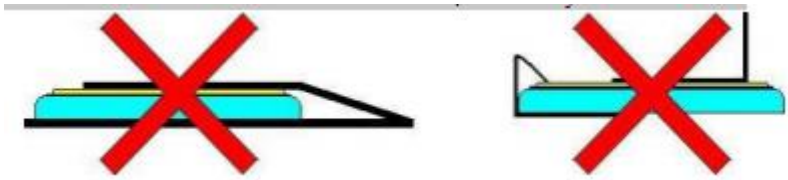


✓ ***When a Battery is Held with Tweezers 用镊子拿电池时***

When held with a pair of metallic tweezers as shown below, the battery short-circuits through the tweezers
当用如下所示的一对金属镊子固定时，电池通过镊子短路

✓ ***When Battery Lead Plates Touch Each Other 当电池引线板相互接触时***

When battery lead plates bend and touch each other or either terminal, the battery short-circuits.
当电池引线板弯曲并相互接触或接触任何一个端子时，电池会短路。



✓ ***Solder Bridges 焊接桥***

Solder may bridge between board conductors, short-circuiting and draining battery.
焊料可能在电路板导体之间桥接，短路和耗尽电池。

✓ ***Short-circuited though Soldering Iron 通过烙铁短路***

Similar to solder bridging, when the circuit board wiring is short-circuited by a soldering iron for an extended period, the battery is drained and consumed. Complete manual soldering within 5 seconds.
与焊料桥接类似，当电路板布线长时间被烙铁短路时，电池被耗尽和消耗。 5 秒内完成手动焊接。

✓ ***Shorts through Piled Circuit Board 通过堆积电路板短路***

When circuit boards with batteries are piled on top of one another, their conductive traces may touch, and form a battery discharge circuit that consumes the battery's power.
当具有电池的电路板堆叠在彼此之上时，它们的导电迹线可能接触，并形成消耗电池电力的电池放电电路。

✓ ***Discharge through Conductive Electrostatic Prevention Mats 通过导电静电防护垫放电***

Conductive mats are widely used to prevent static electricity from destroying semiconductors. If a circuit board with a battery mounted in put on a conductive mat, the soldered conductors may touch the mat, providing a discharge path for the battery.
导电垫广泛用于防止静电破坏半导体。 如果安装有电池的电路板放在导电垫上，则焊接的导体可能接触垫，从而为电池提供放电路径。

✓ ***Improper Battery Mounting Polarity 不恰当的电池安装极性***

When the battery's positive (+) and negative (-) terminals are backward with respect to the battery mounting's polarity marks, the battery may be discharged, depending on the type of electric circuit.
当电池的正极（+）和负极（ - ）端子相对于电池安装的极性标记向后时，根据电路的类型，电池可能会放电。

✓ ***Solder 焊料***

When the battery's lead plates are dipped in a molten solder bath, the battery is temporarily short-circuited. Therefore, complete dipping within 5 seconds.
当电池的铅板浸入熔化的焊料槽中时，电池暂时短路。 因此，在 5 秒内完成浸渍。

EMB reserves the final explanation. Please use battery strictly according to specification. EEMB will not be responsible for any inappropriate operation. EEMB keeps the right to change product specifications without previous notice. If any question, please consult with the manufacturer
EEMB 保留最终解释权。请严格按照规范使用电池。EEMB 对任何不当操作将不负责。EEMB 保留修改产品规格书不另行通知的权利。如有任何问题,请咨询制造商。