Approval Sheet

Of LFP batteries

密封可充电磷酸铁锂电池规格书

Type: LFP batteries

类别：磷酸铁锂电池

Model No.：GS-IFR 21700-3000mAh-6.4V

型号：GS-IFR 21700-3000mAh-6.4V

Prepared By/制定	Checked By/审核	Approved By/批准
Customer Approval/客户确认	**Signature/Date**（签名/日期）	
	Company Name （公司名称）	
	Company Stamp （公司盖章）	

广州高胜电子科技有限公司 **Godson Technology Co., Ltd**

地址：广州市海珠区黄埔村北码头 29 号之四整栋自编 103B（1 号楼）单元，邮编 510330
ADD:Unit 103B (Main Building), Building 4, No. 29 North Pier Road, Huang Pu Village, Haizhu District, Guangzhou, Guangdong, China ,510330

电话TEL：+86-20-29861459 传真FAX：+86-20-29861459

1 Scope 适用范围

This specification is applied to the reference battery in this Specification and manufactured by Godson Technology Co.,Ltd.

Model:GS-IFR 21700-3000mAh-6.4V

本规范适用于磷酸铁锂电池，由广州高胜电子科技有限公司生产。

型号:GS-IFR 21700-3000mAh-6.4V

2 Product Specification 产品规格

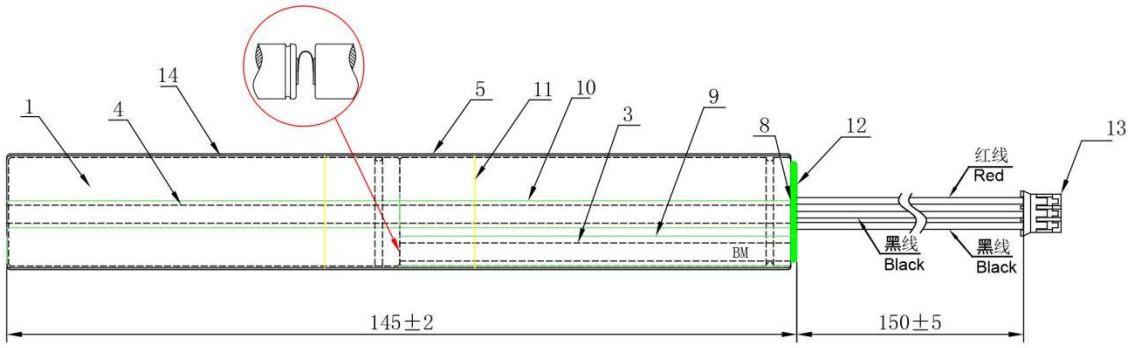
Table 1 （表 1）

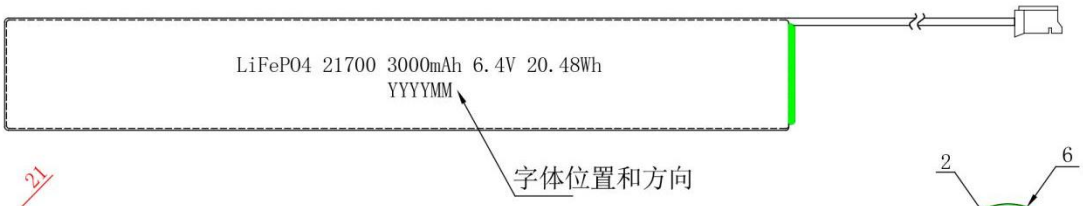
No. 序列	Item 项目	General Parameter 标准参数		Remark 备注
1	Rated Capacity 标称容量	Typical/标准	3000mAh	Standard discharge （$0.2C_5A$） after standard charge 标准充电后 ($0.2C_5A$)标准放电
		Minimum/最小	2925mAh	
2	Nominal Voltage 标称电压	6.4V		
3	Voltage at end of Discharge 放电截止电压	4.0V		Discharge Cut-off Voltage 放电截止电压
4	Charging at end of Voltage 充电截止电压	7.3V		
5	Internal Impedance 内阻	≤120mΩ		Internal resistance measured at AC 1KHz after 50% charge The measure must uses the new batteries that within one week after shipment and cycles no more than 5 times 50%充电后在交流 1KHz 测量的内阻该措施必须使用新电池，在发货后一周内，循环不超过 5 次

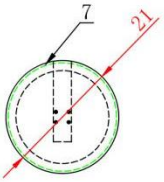
6	Standard charge 标准充电	Constant Current 0.2C_5A Constant Voltage 7.3V 0.02C_5A cut-off 恒流恒压 0.2C_5A 7.3V 0.02C_5A 截止	Charge time： Approx 6h 充电时间：约 6 小时
7	Standard discharge 标准放电	Constant Current 0.2C_5A end Voltage 4.0V 恒流恒压 0.2C_5A 放至 4.0V	
8	Fast charge 快速充电	Constant Current 0.5C_5A Constant Voltage 7.3V 0.02C_5A cut-off 恒流恒压 0.5C_5A 7.3V 0.02C_5A 截止	Charge time： Approx 3h 充电时间：约 3 小时
9	Fast discharge 快速放电	Constant Current 0.5C_5A end Voltage 4.0V 恒流恒压 0.5C_5A 放至 4.0V	
10	Maximum Continuous Charge Current 最大充电电流	1C(3000mA)	
11	Maximum Continuous Discharge Current 最大放电电流	1C(3000mA)	

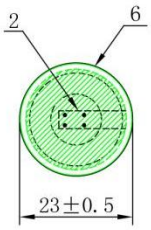
ous the table 1 （表 1）

No. 序号	Item 项目	General Parameter 标准参数	Remark 备注
12	Operation Temperature Range 工作温度范围	Charge： 0~55℃ 充电： 0~55℃	60±25%R.H. Bare Cell 60±25%R.H. 裸电池
		Discharge： -10~60℃ 放电： -10~60℃	
13	Storage Temperature Range 储存温度范围	Less than 1 year： -10~25℃ 一年以下： -10~25℃	60±25%R.H. at the shipment state 60±25%R.H.装运状态下
		Less then 3 months： -20~40℃ 少于 3 个月： -20~40℃	
14	Weight 重量	Approx： 136g / 约： 136 克	FYI 仅供参考









注(NOTE)：

1、红线=158mm，黑线=158mm，黑线=158mm
线规：UL3266 AWG 22#;
Red wire=158mm, Black wire=158mm, Black wire=158mm;
Wire Model:UL3266 AWG 22#;

2、引出片、连接片、引出线、PVC尺寸公差
按《包装材料验收标准》执行
Lead sheet, connecting sheet, lead wire,
PVC dimensional tolerance In accordance
with the Acceptance Standards for Packaging
Materials

3、插头和导线必须是无卤的
Halogen free cable and connector

4、单位：mm
Unit:mm

保护板的插头线焊接方式，如图所示



序号 (NO.)	材料名称 (Name)	规格 (Size)	数量 (Qty)	备注 (Note)
14	纸套 (Paper Sleeve)	外径22.8mm*内径22.3mm*度146mm	1	
13	插头 (Connector)	JST-PHR-3P	1	正向插头 (Forward Connector)
12	电池保护板 (Cell protection board)	GS-1808TP-2-B3(R5460N213AD 8205A-TSSOP-8x2)	1	(B+ B- BM加钢片)
11	高温胶带 High-temperature tape	80*30*0.05	1	茶色 (Dark Brown)
10	绝缘垫 (Insulating Pad)	146x10mm	1	青稞纸 (Barley Paper)
9	绝缘垫 (Insulating Pad)	73x10mm	1	青稞纸 (Barley Paper)
8	绝缘垫 (Insulating Pad)	∮18底垫(直径17.5mm)	1	青稞纸 (Barley Paper)
7	绝缘垫 (Insulating Pad)	∮21底垫(直径20.5mm)	2	青稞纸 (Barley Paper)
6	面圈 (Insulating Pad)	∮21面圈 (直径21mm,内径10mm)	2	青稞纸 (Barley Paper)
5	组合PVC套 (Shrink Sleeve)	155X38X0.1	1	蓝色 (Blue)
4	负极连接片 (Connect Tab)	160X4X0.10	1	镀镍片 (Nickle Plated Tab)
3	BM 连接片 (Connect Tab)	103X4X0.10	1	镀镍片 (Nickle Plated Tab)
2	正极连接片 (Connect Tab)	18X4X0.10	1	镀镍片 (Nickle Plated Tab)
1	单体电池 (Cell)	21700 3000mAh 3.2V	2	LiFePO4

广州高胜电子科技有限公司
GODSON TECHNOLOGY CO., LTD

IFR 2x21700 3000mAh 6.4V 柱型组合图
(IFR 2x21700 3200mAh 6.4V -B STICK Type)

客户名称(代号) (Customer name)	OE
绘制 (DREW)	Simon 2025.10.14
批准 (APPROVED)	Simon 2025.10.14
版本号: (Version Number) A0	页码: (Page) 1/1
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4. Performance And Test Conditions 性能和测试条件

4.1 Standard Test Conditions 标准测试条件

Test should be conducted with new batteries within one week after shipment from our factory and the cell shall not be cycled more than five times before the test. Unless otherwise specified,test and measurement shall be done under temperature of 25±3℃ and relative humidity of 45~48%.if it is judged that the test results are not affected by such conditions,the tests may be conducted at temperature 15~30℃ and humidity 25-85%R.H.

测试应在新电池出厂后一周内进行，测试前电池的循环次数不得超过五次。除另有规定外，试验和测量应在温度为 25±3℃ 和相对湿度为 45% 至 48% 的条件下进行，如果判定试验结果不受这些条件的影响，可在温度为 15% 至 30℃ 和相对湿度为 25% 至 85% 的条件下进行试验。

4.2 Measuring Instrument or Apparatus 测量仪器或设备

4.2.1 Dimension Measuring Instrument 尺寸测量仪

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

尺寸测量应使用精度等于或大于 0.01 毫米的仪器进行。

4.2.2 Voltmeter 电压表

Standard class specified in the national standard or more sensitive class having inner impedance more than 10kΩ/V.

国家标准规定的标准级或内阻大于 10kΩ/V 的更灵敏级。

4.2.3 Ammeter 电流表

Standard class specified in the national standard or more sensitive class.Total external resistance including ammeter and wire is less than 0.01Ω.

国家标准规定的标准级或更灵敏级。包括电流表和导线在内的总外部电阻小于 0.01Ω。

4.2.4 Impedance Meter 内阻测试仪

Impedance shall be measured by a sinusoidal alternating current method(1kHz LCR meter)

应使用正弦交流电法（1 kHz LCR 表）测量阻抗

4.3 Standard Charge/Discharge 标准充放电

Standard charge：Test procedure and its criteria are referred as follows：

0.2C_5A=600mA

标准充电：测试程序及其标准如下：0.2C_5A=600mA

Charging shall consist of charging at a 0.2 C_5A constant current rate until the cells reaches 3.65V. The cells shall then be charged at constant voltage 0f 7.3 volts while tapering the charge current Charging shall be terminated when the charging current has tapered to 0.02 C_5A.Charge time ： Approx 6.0h,The cell shall demonstrate no permanent degradation when charged between 0℃ and 55℃.

充电应包括以 0.2 C_5A 的恒定电流率充电，直到电池电压达到 7.3 伏。充电时间：约 6 小时，在 0℃ 至 55℃ 之间充电时，电池应无永久性衰减。

Standard Discharge 标准放电 0.2C_5A=600mA

Cells shall be discharged at a constant current of 0.2 C_5A to 4.0 volts ＠25℃±3℃.
If no otherwise specified,the rest time between Charge and Discharge amount to 30min.
电池应在 0.2C_5A 至 4.0V（@25℃±3℃）的恒定电流下放电。
如无特殊规定，充放电之间的休息时间为 30 分钟。

4.4 Appearance 外观

There shall be no surface defect as flaw,crack,rust,leakage,which may adversely affect commercial value of battery.
电池表面不得有瑕疵、裂纹、锈蚀、渗漏等可能对电池商业价值产生不利影响的缺陷。

4.5 Initial Performance Test 初始性能测试

Table 2 （表 2）

Item 项目	Test Method Condition 测试方法和条件	Requirements 要求
（1） Open-circuit Voltage 开路电压	The open-circuit voltage shall be measured within 24 hours after standard charge. 开路电压应在标准充电后 24 小时内测量。	≥6.60V
（2） Internal impedance 内阻	Internal resistance measured at AC 1KHz after 50% charge.充电 50%后在 1KHz 交流电频率下测量的内部电阻。	≤120mΩ
（3） Minimal Rated Capacity 最小额定容量	The capacity on 0.2C_5A discharge till the voltage tapered to 2.0V shall be measured after rested for 30min then finish standard charge. 0.2C_5A 放电至电压渐降至 2.0V 时的容量应在静置 30 分钟后测量，然后完成标准充电。	Discharge Capacity ≥2925mAh 放电容量 ≥2925mAh

Temperature Dependence of discharge capacity 放电容量与温度的关系

Cells shall be charged per and discharged ＠ 0.5 C_5A to 4.0 volts.Except to be discharged at temperature per Table 3. Cells shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature.The capacity of a cell at each temperature shall be compared to the capacity achieved at 23 ℃ and the percentage shall be calculated.Each cell shall meet or exceed the requirements of Table 3.
电池充电和放电 @0.5 C_5A 至 4.0 伏，但在表 3 所列温度下放电的电池除外。电池放电前应在试验温度下存放 3 小时，然后在试验温度下放电。电池在每个温度下的容量应与在 23℃下的容量相比较，并计算出百分比。

Table 3（表 3）

Discharge Temperature 放电温度	-10℃	0℃	23℃	60℃
Discharge Capacity(0.5 C_5A) 放电容量 (0.5 C_5A)	50%	80%	100%	95%

Cycle Life and Leakage-Proof 循环寿命和防渗漏功能

Table 4（表 4）

No. 序号	Item 项目	Criteria 标准	Test Conditions 测试条件
1	Cycle Life （0.5 C_5A） 周期寿命 （0.5 C5A）	Higher than 70% of the Initial Capacities of the Cells 高于电池初始容量的 70%	Carry out 1000cycle Charging/Discharging in the below condition. ◆ Charge:Standard Charge, ◆ Discharge:0.5 C_5A to 4.0V ◆ Rest Time between charge/discharge:30min. ◆ Temperature:25±3℃ 进行 1000 次循环充电/放电。 ◆ 充电：标准充电、 ◆ 放电：0.5 C_5A 至 4.0V ◆ 充放电间隔时间：30 分钟。 ◆ 温度：25±3
2	Leakage-Proof 防渗漏	No leakage (visual inspection) 无泄漏（目测）	After full charge with standard charge,store at 60±3℃,60±10%RH for 1 month. 用标准充电法充满电后，在 60±3℃, 60±10%RH 下保存 1 个月。

5. Mechanical characteristics and Safety Test 机械特性和安全测试

Table5 （表 5） （Mechanical characteristics）（机械特性）

No. 序号	Item 项目	Test Method and Condition 测试方法和条件	Criteria 标准
1	Vibration Test 振动测试	After standard charging,fixed the cell to vibration table and subjection cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz to 55Hz,the excursion of the vibration is 1.6mm.The cell shall be vibrated for 30minutes per axis of XYZ axes. 标准充电后，将电池固定在振动台上，进行循环振动，频率在 10Hz 至 55Hz 之间以每分钟 1Hz 的速度变化，振动偏差为 1.6mm。	No leakage No fire 无泄漏 无起火
2	Drop Test 跌落测试	The cell is to be dropped from a height of 1 meter twice to concrete ground.电池将从 1 米高处两次掉落到水泥地面上。	No explosion, No fire,no leakage. 无爆炸、无起火、无泄漏。

Table 6 （表 6） （Safety Test） （安全测试）

Item 项目	Battery Condition 电池状态	Test Method 测试方法	Requirements 要求
Crush 挤压	Fresh,Fully charged 新的，充满电的	Crush between two flat plates.Applied force is about 13kN(1.72Mpa) for 30min. 在两块平板之间挤压， 挤压力约为 13kN（1.72Mpa），持续 30 分钟。	No explosion,No fire(Single cell,no PCM) 无爆炸，无起火（单电池，无保护板）
Short Circuit（20℃） 短路（20℃）	Fresh,Fully charged 新的，充满电的	Each test sample battery,in turn,is to be short-circuited by connecting the (＋)and (－) terminals of the battery with a Cu wire having a maximum resistance load of 0.1 Ω . Test are to be conducted at room temperature (20℃±2℃). 用最大电阻负载为 0.1Ω 的铜线连接电池的（＋）和（-）端子，依次将每个测试样品电池短路。测试在室温（20℃±2℃）下进行。	No explosion,No fire.The Temperature of the surface of the Cells are lower than 150 ℃ (Single cell,no PCM) 无爆炸、无起火，电池表面温度低于150℃（单电池，无保护板）
Short Circuit（60℃） 短路（60℃）	Fresh,Fully charged 新的，充满电的	Each test sample battery,in turn,is to be short-circuited by connecting the (＋)and (－) terminals of the battery with a Cu wire having a maximum resistance load of 0.1 Ω . Test are to be conducted at temperature (60℃±2℃). 用最大电阻负载为 0.1Ω 的铜线连接电池的（＋）和（-）端子，依次将每个测试样品电池短路。测试在温度（60℃±2℃）下进行。	No explosion,No fire.The Temperature of the surface of the Cells are lower than 150 ℃ (Single cell,no PCM) 无爆炸、无起火，电池表面温度低于150℃（单电池，无保护板）
Impact 跌落	Fresh,Fully charged 新的，充满电的	A 56mm diameter bar is inlaid into the bottom of a 10Kg weight.And the weight is to be dropped from a height of 1m onto a sample battery and then the bar will be across the center of the sample. 在一个 10 千克重的砝码底部镶嵌了一根直径 56 毫米的横杆，砝码将从 1 米高处掉落到样品电池上，然后横杆将穿过样品的中心。	No explosion,No fire(Single cell,no PCM) 无爆炸、无起火（单电池，无保护板）

Forced Discharge 强制放电	Fresh,Fully charged 新的，充满电的	Discharge at a current of 1 C_5A for 2.5h. 以 1 C_5A 的电流放电 2.5 小时。	No explosion,No fire(Single cell,no PCM) 无爆炸、无起火（单电池，无保护板）
Nail Pricking 针刺	Fresh,Fully charged 新的，充满电的	Prick through the sample battery with a nail having a diameter of 3mm and remain 2h. 用直径为 3 毫米的钉子刺穿样品电池，并保持 2 小时。	No explosion,No fire(Single cell,no PCM) 无爆炸、无起火（单电池，无保护板）

6. Handling of Cells 电池处理

Prohibition short circuit

Never short circuit cell.It generates very high current which causes heating of the cells and may cause electrolyte leakage are very dangerous.

The tabs may be easily short-circuited by putting them on conductive surface.

Such outer short circuit may lead to heat generation and damage of the cell.

An appropriate circuitry with PCM shall be employed to protect accidental short circuit of the battery pack.

禁止短路

切勿将电池短路。短路会产生非常大的电流，导致电池发热，并可能造成电解液泄漏，这是非常危险的。

把电池片放在导电表面上很容易造成短路。

这种外部短路可能会导致电池发热和损坏。

应采用带有保护板的适当电路来保护电池组的意外短路。

7. Notice for Designing Battery Pack 电池组设计注意事项

7.1 Pack toughness 电池组的韧性

Battery pack should have sufficient strength and the cell inside should be protected from mechanical shocks.电池组应有足够的强度，内部的电池单元应避免受到机械冲击。

7.2 Cell fixing 电池固定

The cell should be fixed to the battery pack by its large surface area.

No cell movement in the battery pack should be allowed.

电池应通过其较大的表面积固定在电池组上。

电池单元不得在电池组中移动。

7.3 Inside design 内部设计

No sharp edge components should be insides the pack containing the cell.

装电池的电池包内不得有尖锐边缘的部件。

7.4 Tab connection 连接方式

Spot welding is recommended for tab connection method.

建议采用点焊作为连接方式。

Battery pack should be designed that shear force are not applied to the tabs.

电池组的设计应确保不会对接线片施加剪切力。

If apply manual solder met hod to connect tab with PCM.below notice is very important to ensure battery ◆・performance：

如果使用手工焊接方法将接片与 PCM 连接，以下注意事项对确保电池◆性能：非常重要。

◆・The solder iron should be temperature controlled and ESD safe;

烙铁应具有温度控制和防静电功能；

◆・Soldering temperature should not exceed 350℃;

焊接温度不应超过 350℃；

◆・Soldering time should not be longer than 3s;

焊接时间不应超过 3 秒；

◆・Soldering times should not exceed 5 times,Keep battery tab cold down before next time soldering;

焊接次数不应超过 5 次，下次焊接前应保持电池片冷却；

◆・Directly heat cell body is strictly prohibited,Battery may damaged by heat above approx.100℃.

严禁直接加热电池体，温度超过 100℃可能损坏电池。

8. For mishaps 意外事故

Battery pack should be designed not to generate heat even when leakage occurs due to

电池组应设计成即使由于下列原因发生漏液也不发热

mishaps.事故

1） Isolate PCM (Protection Circuit Module) form leaked electrolyte as perfectly as possible.

尽可能完美地将 PCM（保护电路模块）与泄漏的电解液隔离。

2） Avoid narrow spacing between bare circuit patterns with different voltage.(Including around connector) 避免不同电压的裸电路图案之间的间距过窄（包括连接器周围）。

3） Battery should not have liquid from electrolyte,but in case if leaked electrolyte as possible touch bare circuit patterns,higher potential terminal material may dissolve and precipitate at the lower potential terminal,and may cause short circuit,The design of the PCM must have this covered.

电池不应有电解液，但如果泄漏的电解液尽可能接触到裸电路图案，高电位端子材料可能会溶解并析出到低电位端子，并可能导致短路，PCM 的设计必须考虑到这一点。

9. Notice for Assembling Battery Pack 电池组组装注意事项

Shocks,high temperature,or contacts of sharp edge components should not be allowed in battery pack assembling process. 电池组组装过程中不得有震动、高温或接触尖锐边缘部件。

10. Others 其他

10.1 Cell connection 电池连接

1） Direct soldering of wire leads or devices to the cell is strictly prohibited.

严禁将导线或器件直接焊接到电池上。

2) Lead tabs with pre-soldering may cause damage of components,such as separator and insulator.by heat generation.

预焊的引线片可能会因发热而损坏隔膜和绝缘体等部件。

10.2 Prevention of short circuit within a battery pack 防止电池组内部短路

Enough insulation layers between wiring and the cells shall be used to maintain extra safety protection. 电线和电池之间应有足够的绝缘层，以保持额外的安全保护。

The battery pack shall be structured with no short circuit within the battery pack ,which may cause generation of smoke or firing. 电池组的结构应避免电池组内部短路，以免产生烟雾或起火。

10.3 Prohibition of disassembly 禁止拆卸

1）Never disassemble the cells 切勿拆卸电池

The disassembling may generate internal short circuit in the cell,which may cause gassing,firing,explosion,or other problems.

拆卸电池可能会导致电池内部短路，从而引起析气、打火、爆炸或其他问题。

2) Electrolyte is harmful 电解液有害

Battery should not have liquid from electrolyte flowing,but in case the electrolyte come into contact with the skin,or eyes,physicians shall slush the electrolyte immediately with fresh water and medical advice is to be sought.

电池不得有电解液流动，但如果电解液接触到皮肤或眼睛，医生应立即用清水冲洗电解液，并寻求医疗建议。

10.4 Prohibition of dumping of cells into fire 禁止将电池倾入火中

Never incinerate nor dispose the cells in fire.These may cause explosion of the cells,which is very dangerous and is prohibition.

切勿将电池片焚烧或丢入火中，这可能会导致电池片爆炸，非常危险，应予以禁止。

10.5 Don’t immerse the cell in water and seawater. Please put it in cool and dry environment if no using.

勿将电池片浸入水中或海水中。如果不使用，请放在阴凉干燥的环境中。

10.6 Battery cells replacement 更换电池

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user. 只能由电池供应商或设备供应商更换电池，用户不得自行更换。

10.7 Prohibition of use of damaged cells 禁止使用损坏的电芯

The cells might be damaged during shipping by shock.If any abnormal features of the cells are found such as damages in a plastic envelop of the cell,deformation of the cell package,smelling of an electrolyte ,an electrolyte leakage and others,the cells shall never be used any more.

电池在运输过程中可能受到冲击而损坏。如果发现电池有任何异常现象，如电池 塑料外壳损坏、电池包装变形、电解液有异味、电解液泄漏等，则不得继续使用。

The cells with a smell of the electrolyte or a leakage shall be placed away from fire to avoid firing or explosion. 有电解液气味或泄漏的电池应远离火源，以避免起火或爆炸。

11. Period of Warranty 保修期限

The period of warranty is one year from the date of shipment.Godson guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer abuse and misuse.

保修期为自发货之日起一年，高胜保证为客户更换经证实因制造工艺而非客户滥用和误用造成缺陷的电芯。

12. Storing the Batteries 存储电池

The batteries should be stored at room temperature,charged to about 30% to 50% of capacity.
电池应存放在室温下，充至约 30% 至 50% 的电量。

We recommend that batteries be charged about once per half a year to prevent over discharge.
我们建议每半年对电池充电一次，以防止过度放电。

13. Other The Chemical Reaction 其他 化学反应

Because batteries utilize a chemical reaction,battery performance over time even if stored for a long period of time without being used.In addition,if the various usage conditions such as charge,ambient temperature,etc.are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.if the batteries cannot maintain a charge for long periods of time,even when they are charged correctly,this may indicate it is time to change the battery.

此外，如果各种使用条件（如充电、环境温度等）未保持在规定的范围内，则可能会缩短电池的使用寿命，或因电解液泄漏而损坏使用电池的设备。

14. Note：注意事项

Any other items which are not covered in this specification shall be agreed by both parties.
本规范未涉及的任何其他项目应经双方同意。