



Li-ionPolymer Battery Specification

锂离子聚合物电池规格书

Pack Type 组合类型: Cell +PCM/电+保护板

Cell Model 电芯型号: 3x113647-2200mAh

Product Capacity 产品容量: 2200mAh/11.1V

Part Code 产品编码:

Customer Code 客户代码:

Customer material number 客户料号:

Total Page 文件页数: 13

The company acknowledges 公司承认 (Stamp) (盖章)	Registered 编制	Checked by 审核	Approved 批准
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	2020-09-08	2020-09-08	2020-09-08

Approved by customer 客户承认 (Stamp) (盖章)	Tested by 测试	Checked by 审核	Approved 批准

Remark: The company reserves the right to modify the specifications without informing customers.

备注: 本公司保留在未通知客户的情况下, 对规格书进行修改的权利!

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Product Modified Record List

产品变更履历表

Revision 版本	Description 内容描述	Registered 编制	Approval 审批人	Date 日期
A0	The new release新版发行	冯文武	刘成	2020-09-08



1.Scope 适用范围

This product recognition describes the design and manufacture of rechargeable lithium-ion batteries by Dongguan Howell Energy Co., Ltd. (HOWELL), which is the basis for product design, production and inspection. Its function is to let customers understand the product quality standards and correct use methods.

本产品承认书描述东莞市鸿伟能源有限公司（HOWELL），设计制造的可充电锂离子电池，它是产品设计、生产和检验的依据。其作用是让客户了解产品的质量标准和正确使用方法。

Reference standard 参考标准:

GB/T 18287-2013 中华人民共和国国家标准《蜂窝电话用锂离子电池总规范》

GB31241-2014《便携式电子产品用锂离子电池和电池组安全要求》

IEC/EN61960 欧盟锂电池标准 UL1642 美国锂电池安全标准

2.Product basic information 产品基本信息

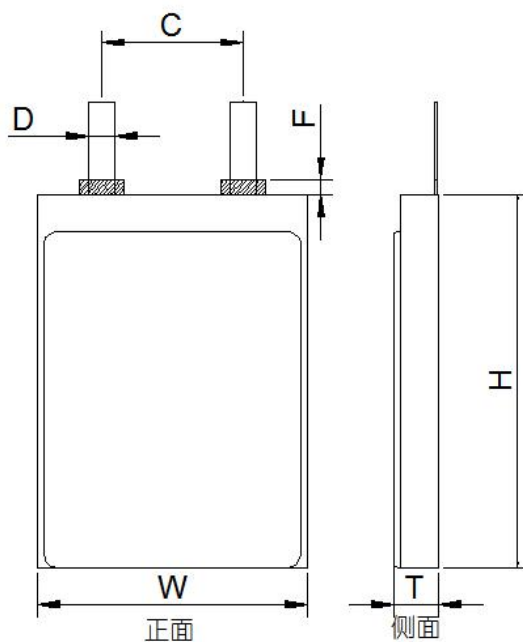
No.	Items 项 目			Parameter 参 数	
1	Battery model 电池型号			2x113647	
2	Shipment voltage 出货电压			3.8V-4.0V	
3	Inner Impedance 内阻（交流阻抗 AC 1kHz）			Cell/电芯≤60mΩ	Battery/电池≤250mΩ
4	pack weight 成品重量			Approx(约): 134g	
5	Design scheme 保护电路设计方案			-	
6	Typical capacity 典型容量		2250mAh	0.2C Discharge 0.2C 放电	
	Minimal capacity 最小容量		2200mAh		
7	Nominal voltage 标称电压			3.7V/	
	Fully charge voltage(FC)满充电压			4.2V	Defined in this DOC: FC = 4.2V
	Fully discharge voltage(FD)满放电压			3.0V	Defined in this DOC: FD = 3.0V
8	Short circuit protection 短路保护功能			Yes 有	
9	Max continuous charge current 最大充电持续电流			0℃~15℃	0.2C
				15℃~35℃	0.5C
				35℃~45℃	0.5C max to 4.1V, then CV to 0.05Cmin
10	Max continuous discharge current 最大放电持续电流			-10℃~60℃	1C
12	Cycle life 循环寿命			300 次充放电后，电池能恢复 80%的容量 （详见 6.4 项） After 300cycles charge/discharge, battery can recover 80% of its capacity (Detail in 6.4)	
13	Storage temperature 储存 温度	-20℃~50℃	≤7 day	The recovery capacity shall not be less than80% of the capacity 恢复容量不低于容量的 80%,Recommended storage temperature is 25±2 ℃ of half charge state (3.7~3.95v), humidity 45 to85%。推荐储存温度 25±2 ℃，电芯为半电状态(3.7~3.95v)储存, 湿度 45 ~ 85%。	
		-20℃~40℃	≤1 month		
		-20℃~30℃	≤1 year		

Remarks: Item 2.2 and 2.6 test results shall be subject to the test results within 7 days after receiving the goods.

备注：2.2 项，2.6 项测试结果以收到货 7 天内测试为准。

3.Cell 电芯参数:

3.1. Cell outline drawing 电芯外形尺寸(Not In Scale 未按比例)

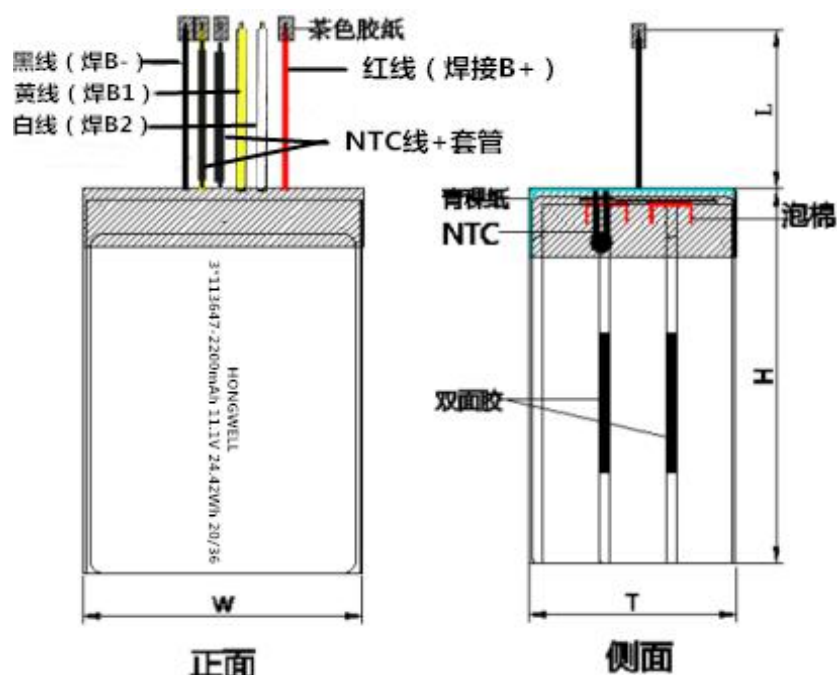


3.2. Cell Performance parameters 电芯性能参数

NO. 编号	Item项目		Specification规格	Unit 单位	Remarks备注
1	Dimensions 外形尺寸	T	Max11.3	mm	Thickness厚度
2		W	Max 36.5	mm	Width 宽度
3		H	Max 46.5	mm	Cell length (not include Tab sealant) 电芯长度 (不含极耳胶)
4		C	18.5 ±1.5	mm	Tab center distance极耳中心距
5		D	3±0.2	mm	Tab width 极耳宽度
6		F	0.2-2	mm	Tab exposed size极耳胶外露尺寸

4.Battery Outline Drawing 电池组外形尺寸

4.1. Battery Outline Drawing 电池组外形尺寸(Not In Scale 未按比例)



4.2. Spray Content 电池喷码:

HONGWELL

3*113647-2200mAh 11.1V 24.42Wh 20/36

20/36 is the date code, 20 represents 2020, 36 represents 36 weeks, and the year and week changes with the actual situation.

在喷码中 20/36为日期码, 20代表 2020 年, 36代表36周, 年周随实际变化。

4.3.Battery Performance parameters 电池组性能参数

NO.序号	Item 项目	Specification 规格
1	After 300 cycles, thickness size 300 次循环后, Max 厚度 T	37mm
2	thickness size Max 厚度 T	34.5mm
3	width size Max 宽度 W	37mm
4	Height size Max 高度 H	50mm
5	The leakage line length 外露线长 L	25±3mm
6	Direction of outgoing line 出线方向	See figure 见图

4.4.BOM 1(Bill of materials)电池物料清单

NO.序号	Material Name 零件名称)	Specification(规格型号)	Qty 用量(PCS)
1	Cell 电芯	113647-2200mAh	3
2	Red wire 红色导线	UL1007-18#	1
3	Black wire 黑色导线	UL1007-18#	1
4	Yellow wire 黄色导线	UL1007-22#	1
5	White wire 白色导线	UL1007-22#	1
6	Yellow Tape 茶色高温胶	T*W =0.05*25mm	1
7	Yellow Tape 茶色高温胶	T*W =0.05*8mm	1
8	NTC (见图)	10KΩ±1%, B=3435	1

5. General Performance 常规性能

No. 序号	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
5.1	standard charge 标准充电	0.2C CC (constant current) charge to FC, then CV(constant voltage FC)charge till charge current decline to $\leq 0.01C$ 0.2C CC (恒流) 充电至 FC, 再 CV (恒压 FC) 充电直至充电电流 $\leq 0.01C$	约 300min(分钟)
5.2	0.2C Capacity 0.2C 容量	At standard testing condition, after standard charging, rest battery for 10min, then discharging at 0.2C to voltage FD, recording the discharging time. 在标准测试环境下, 标准充饱电后, 搁置 10 分钟, 然后用 0.2C 电流放电至 FD, 所记录放电时间	≥ 300 min(分钟)
5.3	1C Capacity 1C 容量	At standard testing condition, after standard charging, rest battery for 10min, then discharging at 1C to voltage FD, recording the discharging Capacity 在标准测试环境下, 标准充饱电后, 搁置 10 分钟, 然后用 1C 电流放电至 FD, 记录容量	≥ 56 min (分钟)
5.4	Cycle Life 循环寿命	At standard testing condition, constant current 0.2C charge to FC, then constant voltage charge to current declines to 0.01C, rest 10min, constant current 0.2C discharge to FD, rest 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells 在标准测试环境下, 先用 0.2 C 恒流充电至 FC, 再恒压 FC 充电直至充电电流 $\leq 0.01C$, 搁置 10 分钟, 再用 0.2C 电流放电至 FD; 又搁置 10 分钟, 重复以上步骤, 直到放电容量是初始容量的 80%	≥ 300 times(次)
5.5	Capability of keeping electricity 荷电保持能力	At standard testing condition, After standard charging, no outer loading circuit, rest the pack 28days, discharging at 0.2 C to voltage FD, recording the discharging time. 在标准测试环境下, 标准充饱电后, 无外接负载线路, 电池组合搁置 28 天, 然后用 0.2C 放电至 FD, 所记录放电时间.	≥ 270 min (分钟)

6. Condition adapting characteristics 环境适应性 (n=1)

No. 序号	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
6.1	High/low Temperature 高/低温性能	After the battery full charging at $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$, measure the discharging capacity with discharging current 0.2C till 3.0 (V) cut off voltage at different temperature. (as compared with initial capacity) 在 $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 条件下满充电后, 测量电池在不同温度下用 0.2 C5A 电流放电至 3.0 (V) 所放出的容量 (与初始容量作为较)。	在 -10°C 时 $\geq 70\%$ At -10°C is $\geq 70\%$ 在 55°C 时 $\geq 95\%$ At 55°C is $\geq 95\%$

6.2	Invariableness humid and hot 恒定湿热	After put the battery in the invariableness humid and hot box of $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and relative humidity of 90~95% for 48 hours, and with discharging current 0.2C till $3.0 \times n(\text{V})$ cut off voltage. 将电池放入 $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 及相对湿度为 90~95% 的恒温恒湿箱中 48 小时后, 再以 0.2C 电流放电至 $3.0 \times n(\text{V})$ 。	No visible distortion, fire or explosion, the discharging time $\geq 3\text{h}$. 无泄漏、冒烟、起火或爆炸; 放电时间 $\geq 3\text{h}$ 。
6.3	Vibration 振动	The full charging battery vibrate from 90 to 100 minutes at three mutually perpendicular planes with excursion of 0.8mm, and change the frequency from 10 to 55 HZ with 1Hz/min speed. 满充电后的电池在三个相互垂直的方向按振 0.8mm 的谐振形式进行振动, 频率在 10-55HZ 以 1Hz/min 的速率变化, 往复振动 90 至 100min.	The battery has no distortion, no visible evidence of leakage fume fire or explosion the battery voltage $\geq n \times 90\%$ initial voltage. 电池外观无变形, 无漏液、冒烟、起火或爆炸电压 $\geq n \times 90\%$ 初始电压 (V)
6.4	Free fall 自由跌落	The battery fall from a height of 1m free fall into the cement floor, from X、Y、Z positive and negative direction of each direction free fall time, and with discharging current 1.0C till $3.0 \times n(\text{V})$ cut off voltage. 电池将从 1 米高处自由跌落到水泥地板上, 从 X、Y、Z 正负方向每个方向自由跌落一次, 再以 1.0C 放电至 $3.0(\text{V})$	The battery has no distortion, no visible evidence of leakage fume, fire or explosion the Battery voltage $\geq n \times 90\%$ Initial voltage. 电池外观无变形, 无漏液、冒烟、起火或爆炸电压 $\geq n \times 90\%$ 初始电压 (V)

7. Safety performance 安全性能 (n=1)

No. 序号	Item 项目	Test Methods and Condition 测试方法和条件	Criteria 标准
7.1	Forced Discharge test 强制放电	A discharged cell is subjected to a reverse charge at 1C for 90 min. 电池先以 0.2C 放电至终止电压, 再以 1C 电流, 对电池进行反向充电, 90min 以上	No fire, No explosion 无起火, 无爆炸
7.2	Overcharge Test 过充电测试	After discharged at a constant current of 0.2C5A to the cut-off voltage, the battery shall be charged at 1.0C/4.6V for 7.0hrs.(0.2C 放电至截止电压后, 电池用 1C /4.6V 恒流恒压充电 7.0h)。	No explosion, No fire (无起火、无爆炸)
7.3	Low pressure 低气压测试	Each fully charged cell is placed in a vacuum chamber, in an ambient temperature of 20~25°C. Once t	No leakage, No fire, No

		he chamber has been sealed, its internal pressure is gradually reduced to a pressure equal to or less than 11.6 kPa (this simulates an altitude of 15240 m) held at that value for 6 h. 电池放在一个模拟真空的空间放置 6 小时, 环境温度为 20~25℃, 真空环境压力≤11.6kpa, 模拟 15240m 高空低压环境	explosion 无泄漏, 不起火, 不爆炸
7.4	Short test 短路测试	The fully charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with resistance load 80±20 mΩ Tests are to be conducted at room temperature 20~25℃. 在室温 20~25℃ 把充满电的电池的正负极用 80±20 mΩ 的负载连接起来, 连接起来使电池外部短路	No fire, no explosion Cell surface temperature does not exceed 150 °C 无起火, 无爆炸 电池表面温度不超过 150℃
7.5	Projectile Test 焚烧试验	In the ambient temperature, the battery is placed on the wire net of the alcohol lamp burning, until the battery is completely destroyed or the fire explodes, 在环境温度下, 将电池放在用酒精灯烧红的钢丝网上观察, 直到电池完全烧毁或起火爆炸。	Any part of the octagon eight aluminum mesh is not damaged, not out of the battery eight aluminum mesh. 八角笼的八面铝网不得破损、电池的任何部分不得穿出此八面铝网。
8.6	Soak Test 浸泡测试	Put the fully charged batteries into clean water, be soaked for 24 hours. 把满充电的电池放进清水中浸泡 24 小时	No break, No fire 无破裂, 无起火
7.7	Crush test 挤压测试	Fully charged the battery in accordance with standard charge condition, the battery is to be crushed between two flat plates. Continuous to applied force on battery of 13kN(17.2Mpa), stopped until a pressure reading of 17.2Mpa is reached on the hydraulic ram 电池按标准充电条件充满电, 放置在两块平面金属板间, 持续施加 13KN (17.2Mpa) 的压力, 直到液压油缸施加的压力达到 13KN (17.2Mpa) 时停止。	No fire, No explosion 无起火, 无爆炸

※ Above testing of safe characteristic must be with protective equipment.(安全性能测试应在有保护措施下进行)

8. Testing requirements 测试要求

NO.	Battery Standard testing condition 标准测试环境（无特别注明时，试验环境应符合此项要求）
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8.1	Temperature 温度	23°C±2°C
8.2	Relative humidity 相对湿度:	45~85% RH
8.3	Atmospheric pressure 大气压力:	86~106 kPa
8.4	Measuring instrumentation requirements 测量仪表要求	
8.4.1	Voltage instrumentation requirements: 电压仪表要求	Measuring the current meter accuracy no less than 0.5Magnitude 测量电压的仪表的精确度不低于 0.5 级
8.4.2	Current instrumentation requirements: 电流仪表要求:	Measuring the current meter accuracy no less than 0.5magnitude 测量电流的仪表精确度不低于 0.5 级
8.4.3	Time instrumentation requirements 时间仪表要求:	Measuring the temperature meter accuracy no less than 0.5 °C 测量时间的仪表精确度不低于 0.1%
8.4.4	Temperature instrumentation requirements/温度仪表要求:	Measuring the temperature meter accuracy no less than 0.5 °C 测量温度的仪表准确度不低于 0.5°C
8.4.5	Impedance instrumentation requirements/内阻仪表要求:	Measuring impedance should by sinusoidal alternating (1KHZ) test 测量内阻应由正弦交变(1KHZ)进行测试

9. Warnings 警告

To prevent the possibility of the pack from leaking, heating, fire .please observe the following precautions:

☆为防止电池组合可能发生的泄漏,发热,起火,请注意以下预防措施:

The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs, pins and needles .Do not strike at pack with any sharp edge parts.

☆电池组合外包装膜易被镍片,尖针等尖锐部件损伤,禁止用尖锐部件碰伤电池。

Do not immerse the battery in liquid such as water, beverages, or other fluids.

☆严禁将电池组合浸入水或饮料或其它液体中。。

Do not use and leave the pack near a heat source as fire or heater.

☆禁止将电池组合放在热高温源旁,如火,加热器等使用设备。

When recharging, use the battery charger specifically for that purpose.

☆充电时请选用锂离子电池专用充电器。



Do not reverse the positive and negative terminals.

☆禁止颠倒正负极使用电池组合。

Do not connect the pack to an electrical outlet .

☆禁止将电池组合直接接入电源插座。

Do not discard the pack in fire or heat it .

禁止将电池组合丢入火或加热器中。

Do not short-circuit the pack by directly connecting the positive and negative terminal with metal object such as wire.

☆禁止用金属直接将电池组合的正负极进行短路连接。

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

☆禁止将电池组合与金属,如发夹,项链等一起运输或贮存。

Do not strike or throw the pack.

☆禁止敲击或抛掷,踩踏电池组合等。

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

☆禁止直接焊接电池组合或电芯,禁止用钉子或其它利器刺穿电池组合或电芯。

10. Cautions 注意

Do not use or leave the pack at very high temperature (for example, at 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(超出 2.9,2.10,2.13 范围)使用或放置电池组合,否则可能会引起电池过热,起火或功能失效,从而导致电池组合寿命减短。

It is prohibited to use or place the battery combination at high temperature (beyond the range of 2.9,2.10,2.13), or it may cause the battery to overheat, catch fire or function failure, which may result in the short battery life.

△电池只能在 0°C~45°C 温度范围充电。超出此温度范围可能导致电池漏液、发热,或导致电池严重的损坏。它也可能导致电池的性能和寿命的恶化。

Do not use it in a location where static electricity is great, otherwise, the safety devices in the pack may be damaged, which will cause hidden trouble of safety.

△禁止在强静电和强磁场的地方使用,否则易破坏电池组合的安全保护装置,带来安全隐患。

If the pack leaks and the electrolyte get into the eyes, do not rub eyes, instead, rinse the eyes, with clean running water, and immediately seek medical attention. Otherwise, eye 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,并立即送医院治疗,否则会伤害眼睛。

If the pack takes 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.

△如果电池组合在使用或贮存中发出异味,发热,变色,变形,或者是在充电过程中出现任何异常现象,立即将电池从充电器或装置中移开,并停止使用。

In case the pack 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.

△如果电池组合的连接点弄脏,使用前应用干布抹净,否则可能会因接触不良而影响性能失效。

Be aware discharged battery may cause fire or smoke, tape the terminals to insulate them.

△废弃之电池应用绝缘纸包住电极,以防起火,冒烟。

The pack should be stored at room temperature, charged to about 40% to 60% of capacity (about 3.8~3.9V) . In case of over-discharge, pack should be charged for one time every 6 months while storing and batteries should be discharge and charge after being stored more than a year in order to activate it and restore energy.

△电池组合应当在室温下存放,应充到 40%至 60%的电量(3.7~3.95V)。为防止电池过放,建议每 6 个月进行一次充电,如储存时间超过一年,建议每年进行一次充、放电以激活电池。

The battery pack should be stored at room temperature and should be charged 40 to 60 percent (3.7 ~ 3.95V). In order to prevent battery overdischarge, it is recommended to charge the battery every 6 months. If the storage time is longer than one year, it is recommended to charge and discharge the battery once a year to activate the battery.

11. Handling of Cells 电池操作注意事项

1. Soft Aluminum foil (铝箔软包装)

Easily damaged by sharp edge parts such as pins and needles, Ni-tabs, comparing with metal-can-cased LIB.

相对于金属壳的方形电池,铝箔软包装比较容易被锐利部件刺损,如针尖、镍带。

△Don't strike battery with any sharp edge parts 勿用尖锐处撞击电池。

△Trim your nail or wear glove before taking battery 剪掉指甲,或者戴手套。

△Clean worktable to make sure no any sharp particle 清理工作台,避免尖锐零部件。

2. Sealed edge may be damaged by heat above 100°C, bend or fold sealed edge.

封边被加热到 100°C 以上以及弯折封边都容易使封边受损。

3. Prohibition short circuit (禁止电池短路)

Never make short pack circuit. It generates very high current which causes heating of the cells and may cause electrolyte leakage, gassing or explosion that are very dangerous. The LIP tabs may be easily short-circuited by putting them on conductive surface. Such outershort circuit may lead to heat generation and damage of the cell.

避免电池短路。短路会产生很高的电流而使电池发热以及电解液泄漏,产生气体或爆炸是非常危险的。极片连接在导电物体表面很容易短路,外部短路会导致发热及损害电池。 4. Using, keep away from heat, High pressure place, and do not beat, hit the battery.

使用过程中,应远离热源、高压场所,并勿摔打、撞击电池。

Battery end of life should be immediately removed from the equipment, Please properly handle security of spent batteries, do not put into fire or water.

电池寿命终止应立刻从设备中取出,废弃电池请安全妥善处理,切勿投入火中或水中。

5. Mechanical shock (机械撞击)

LIP cells have less mechanical endurance than metal-can-cased LIB.

Falling, hitting, bending, etc. may cause degradation of LIP characteristics.

聚合物电池比金属壳方形电池的机械耐久性更小。



跌落、碰撞、弯曲等等都可能会降低聚合物电池的性能。

12. Period of Warranty 保质期

The shelf life of the battery is 1 year from the date of shipment, Please be sure to use batteries in accordance with this specification and the following precautions. Dongguan Howell Energy Co., Ltd. will not be liable for any accidents caused by the failure to operate in accordance with the specifications.

电池的保质期从出货之日期算起为1年，请您务必需遵守本规格书和以下使用注意事项使用电池，对于没有按照规格书进行操作所造成的任何意外事故，东莞市鸿伟能源有限公司将不承担任何责任。

13. Others 其它事项

1. Customers should contact Dongguan Howell Energy Co., Ltd. beforehand if they need to use batteries for applications beyond the requirements of the documents, or use batteries under conditions other than those specified in the documents, because specific experimental tests are needed to verify the performance and safety of the batteries under such conditions.

客户若需要将电池用于超出文件规定以外的应用，或在文件规定以外的使用条件下使用电池，应事先联系东莞市鸿伟能源有限公司，因为需要进行特定的实验测试以核实电池在该使用条件下的性能及安全性。

2. Dongguan Howell Energy Co., Ltd. is not responsible for any accident caused by using batteries under conditions other than those specified in the documents.

对于在超出文件规定以外的条件下使用电池而造成的任何意外事故，东莞市鸿伟能源有限公司概不负责。

3. If necessary, Dongguan Howell Energy Co., Ltd. will inform customers in writing about the improvement measures for correct operation and use of batteries.

如有必要，东莞市鸿伟能源有限公司会以书面形式告之客户有关正确操作使用电池的改进措施。

4. Any matters not mentioned in this specification shall be determined through consultation between the two parties.

任何本说明书中未提及的事项，须经双方协商确定。

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