



SPECIFICATION FOR APPROVAL

客户承认书

Product Type 产品类型	Lithium-ion Polymer Battery 聚合物锂离子电池	
Product Model 产品型号	M801834/500mAh	
File No. 文件编号	8880183400-500-A0	
Effective Date 生效日期	2019 年 09 月 05 日	
Prepared by 制订	Checked by 审核	Approved by 批准
杨应荣	罗国超	张琼慧
Customer Name 客户名称	佳禾	
Customer Approval 客户承认		

东莞市美尼电池有限公司

DONGGUAN MIYEAR BATTERY CO., LTD.

Address: No. 44, shahe road, sicun village, tangxia town, Dongguan city

Tel: 0769-82065366 Fax: 0769-82065365 Website: www.miyear.com www.miyear.cn

地址: 东莞市塘厦镇四村沙河路 44 号

电话: 0769-82065366 传真: 0769-82065365 网址: www.miyear.com www.miyear.cn

History of Revision 修订记录

No 序号	Revision 版本	Date 日期	Changing Content 变更内容
1	A0	2019-09-05	New Released 首版发行

Contents

目录

1.0 SCOPE 适用范围	4
2.0 SPECIFICATION 主要技术参数	4
3.0 BATTERY SIZE 电池外型尺寸	5
4.0 TEST CONDITION AND REQUIREMENT 测试条件和要求	6
4.1 TEST ENVIRONMENT 测试环境.....	7
4.2 MEASURING INSTRUMENT AND EQUIPMENT REQUIREMENTS 测量仪表与设备要求.....	7
4.3 STANDARD CHARGING MODE 标准充电模式.....	7
4.4 STANDARD DISCHARGE MODE 标准放电模式.....	7
4.5 INITIAL CAPACITY 初始容量.....	7
5.0 PRODUCT PERFORMANCE 产品性能	8
5.1 PRODUCT PERFORMANCE 产品常规性能.....	8
5.2 CONDITION ADAPTING CHARACTERISTICS 环境适应性.....	9
5.3 SAFETY PERFORMANCE 安全性能.....	11
6.0 PROTECTION CIRCUIT 保护电路	13
6.1 PCB CHART PCB 线路图.....	13
6.2 CIRCUIT DIAGRAM 电路原理图.....	13
6.3 PCM BOM 保护板单元.....	13
6.4 PCM PARAMETER 保护板参数.....	14
7.0 PACKING DRAWING 包装图	13
8.0 QUALITY ASSURANCE 质量保证	16
9.0 MATTERS NEEDING ATTENTION 电池使用注意事项	16

1.0 Scope 适用范围

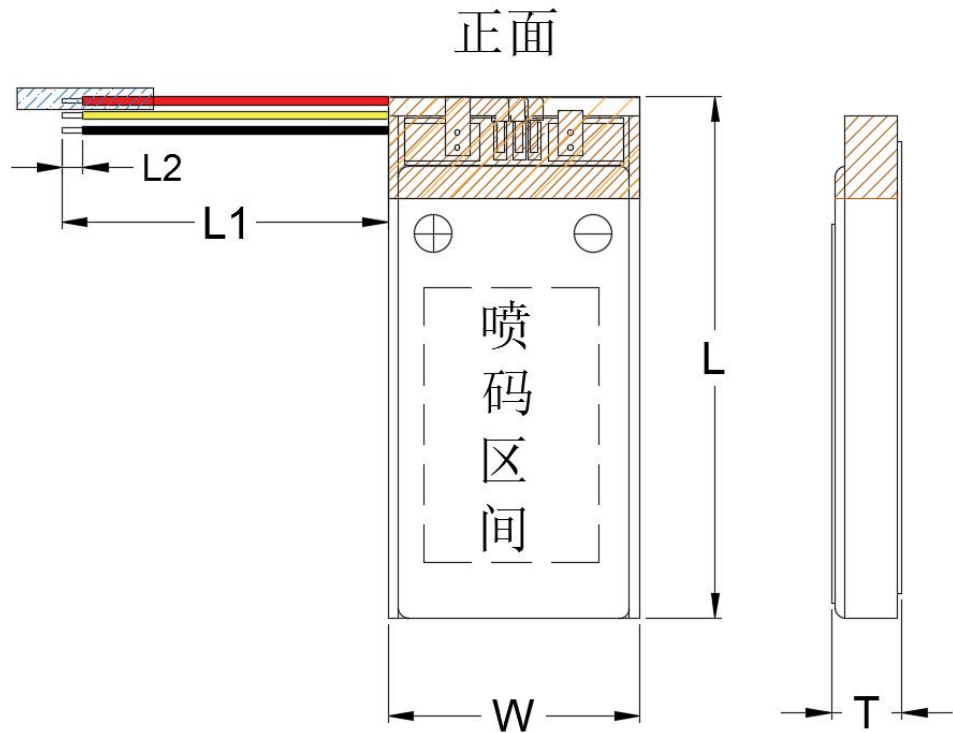
This specification describes the requirements of the lithium-ion polymer rechargeable battery supplied by DongGuan Miyear Electronics Co., Ltd.

本文件描述了东莞市美尼电池有限公司提供的锂离子电池的各项要求。

2.0 Specification 主要技术参数

No. 序号	Item 项目	Specification 规格	Remark 说明
1	Nominal capacity 标称容量	500mAh	Discharging from 4.25V to 2.8V at 0.2C current 0.2C 放电, 电压 4.25V 放电至 2.8V
	Typical capacity 典型容量	520mAh	
2	Energy 能量	1.85Wh	
3	Nominal voltage 标称电压	3.7V	
4	Shipment voltage 出厂电压	3.80~3.95V	
5	Internal impedance 内阻	Battery 电池: $\leq 500\text{m}\Omega$	
6	Charge cut-off Voltage 充电截止电压	4.25V	充电截止电流 0.02C
7	Nominal charging current 标准充电电流	0.2C	
8	Max charge current 最大充电电流	1.0C	
9	Discharge cut-off voltage 放电截止电压	2.8V	
10	Nominal discharging current 标准放电电流	0.2C	
11	Max discharge current 最大充电电流 (25 \pm 2 $^{\circ}$ C)	1.0C	
12	过流保护	1.5~2.5A	
13	Weight 成品重量	10g \pm 0.5g	
14	工作环境 Work environment	0~+9 $^{\circ}$ C 65 \pm 20%RH	0.2C charging 0.2C 充电
		+10~+45 $^{\circ}$ C 65 \pm 20%RH	1.0C charging 1.0C 充电
		-20 $^{\circ}$ C~60 $^{\circ}$ C 65 \pm 20%RH	1.0C discharging 1.0C 放电
15	Storage environment 储存环境	-20~+45 $^{\circ}$ C 65 \pm 20%RH	Less than 1 months 少于 1 个月
		-20~+35 $^{\circ}$ C 65 \pm 20%RH	Less than 6 months 小于 6 个月
		-20~+28 $^{\circ}$ C 65 \pm 20%RH	More than 12 months 小于 12 个月

3.0 Battery size 电池外型尺寸



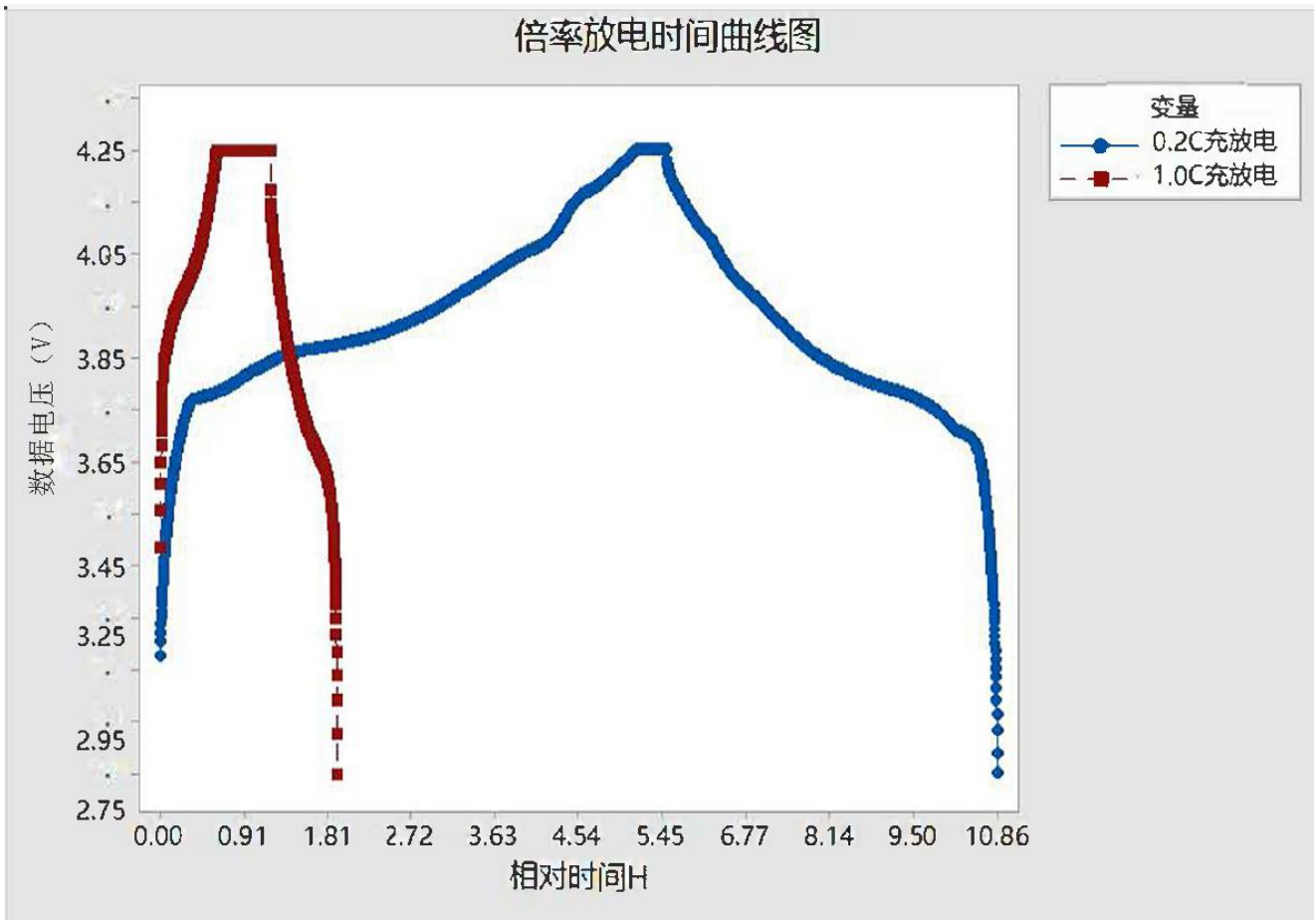
*使用套管绝缘
红色电子线

黄线=NTC
红线=P+
黑线=P-

-M801434 3.7V
+500mAh 1.85Wh
20190907

成品尺寸 单位: mm	长度 (L)	宽度 (W)	厚度 (T)	线长 (L2)			线头 (L1)
				Red (红)	Yellow (黄)	Black (黑)	
	34.5 Max	18.5 Max	8.0 Max	20mm±2	20mm±2	20mm±2	1.5mm±0.5
电池类型	锂离子电池	物料清单	编码	物料名称	型号	单位	用量
型号:	M801834		1	锂离子电芯	P801833DS500	pcs	1
电压:	3.7V		2	PCM	JZX-3816	pcs	1
容量:	520mAh		3	红色电子线	UL3302#28	pcs	1
			4	黑色电子线	UL3302#28	pcs	1
			5	黄色电子线	UL3302#28	pcs	1
		6	茶色高温胶	0.05*20mm*30m	卷	0.008	
东莞市美尼电池有限公司					注意: (单位: mm) 公差要求 (如无标识)		
标题:	电池结构图	制定/日期	杨应荣	审核/日期	罗国超	批准/日期	张琼慧
版本:	A0						
					1. 没有小数±0.5 2. 1位小数±0.1 3. 2位小数±0.05		

3.1 Charge- discharge diagram 充放电曲线图



4.0 Test Condition and requirement 测试条件和要求

4.1 Test environment 测试环境

Unless otherwise specified, this specification item test should be performed in the test under the condition of normal atmospheric pressure

除非另有规定，本规范中个项试验应在试验的标准大气压条件下进行：

- The temperature 温度：20℃~25℃
- Relative humidity 相对湿度：45%~75%
- Atmospheric pressure 大气压力：86K Pa~106K Pa

4.2 Measuring instrument and equipment requirements 测量仪表与设备要求

- Measure the voltage meter accuracy should be not less than 0.5 on the Richter scale, Ω resistance shall be not less than 10 k/V
测量电压的仪表准确度应不低于 0.5 级，内阻应不小于 10K Ω /V。
- Measure the current meter accuracy shall be not less than 0.5
测量电流的仪表准确度应不低于 0.5 级。
- The instrument accuracy measuring time shall be not less than + / - 0.1%
测量时间的仪表准确度应不低于 $\pm 0.1\%$ 。
- Measuring temperature meter accuracy shall be not less than plus or minus + / - 0.5 °C
测量温度的仪表准确度应不低于 $\pm 0.5^\circ\text{C}$ 。
- Adjustable constant current source of constant current, in the process of charging or discharging, the current changes shall be within + / - 1%
恒流源电流恒定可调，在充电或放电过程中，其电流变化应在 $\pm 1\%$ 范围内。
- Constant voltage source voltage is adjustable, and its voltage range is + / - 0.5%
恒压源的电压可调，其电压变化范围为 $\pm 0.5\%$ 。
- Measuring instrument accuracy is not lower than 0.02 mm size
尺寸测量仪的准确度不低于 0.02mm。
- Weighing the quality of the instruments are not less than 0.1 g
称量质量的仪器感量不低于 0.1g。

4.3 Standard charging mode 标准充电模式

Standard temperature $20\pm 5^\circ\text{C}$ Charging battery consist of charging at constant current rate of 0.2C until the battery voltage reach 4.25V .then battery be charged at constant voltage of 4.25V while tapering the charge current. Terminal charge until the charging current drops to 0.02C. Anyway, the total charge time for one cycle is not more than 8 hours

在 $20\pm 5^\circ\text{C}$ 条件下，电池用 0.2C 充电，当电池电压达到 4.25V 时改为恒压充电，直到充电电流小于或等于 0.02C 时，停止充电。每次标准充电时间不能超过 8 小时。

4.4 Standard Discharge mode 标准放电模式

Standard temperature $23\pm 2^\circ\text{C}$ discharge to the cut-off voltage with 0.2C current.

在 $23\pm 2^\circ\text{C}$ 环境温度条件下以 0.2C 的电流将电池放电到终止电压。

4.5 Initial Capacity 初始容量

The standard charge mode for charging, then the standard discharge mode to discharge, measured for the first time the battery capacity is the initial capacity.

按标准充电模式进行充电，再以标准放电模式进行放电，在此方式下所测得的首次电池容量即为初始容量

5.0 Product Performance 产品性能

5.1 Product performance 产品常规性能

No. 序号	Item 项目	Testing Instruction 测试方法	Requirements 标准
1	Minimum capacity 最小容量	The discharge performance means the time which is measured with discharge current of 0.2C CC(constant current) with 2.8V cut-off voltage within 1 hour after full charge. 标准充电后, 0.2C 恒流放电至截止电压 2.8V 测量其放电容量。	≥500mAh
2	Cycle Life 循环寿命	When the discharge capacity reduced to 80% of rated capacity, Stop testing 当放电容量降至额定容量的 80%时, 停止测试。	The cycle times is not less than 500 time 循环次数不小于 500 次
3	High-temperature performance 高温性能	After the standard charge ,a cell is stored in an ambient temperature of 55±2℃ for 2 hours, then discharged to cut-off voltage 2.8V with a constant current of 0.2C.标准充电后, 储存在 55±2℃环境中 2h, 然后 0.2C 恒流放电至截止电压 2.8V。	Retention Capacity rate ≥80% 剩余容量率≥80% No smoke. No leakage.无明显变形、冒烟或破裂, 不漏液。
4	Low-Temperature discharge 低温放电	After charging, the battery according to standard mode into - 10 + 2 ℃ low temperature box temperature after 4 h, Discharge to termination voltage with 0.2Ita current, 将电池按标准模式充电后, 放入 -10±2℃的低 温箱中恒温 4h 后, 以 0.2ItA 电流放电至终止电压	Discharge time should not be less than 3 hours 放电时间应不低于 3 小时
5	存贮性能 Storage characteristics	After the standard charge , Store in 25℃ for 30days after full charge. 标准充电后, 在 25℃中存放 30 天。	Retention Capacity rate 容量保持率≥ 85% Restoration capacity rate 容量恢复率≥90%
		After the standard charge , Store in 55℃ for 7 days after full charge. 标准充电后, 在 55℃中存放 7 天	

No. 序号	Item 项目	Testing Instruction 测试方法	Requirements 标准
6	Temperature characteristics 温度特性	After the standard charge ,a cell is stored in an environment of specific temperature for 2 hours, then discharged to cut-off voltage 2.8V with a constant current of 0.2C. 标准充电后, 储存在特定温度的环境中 2h, 然后 0.2C 恒流放电至截止电压 2.8V。	Capacity rate at -10℃≥60% -10℃放电容量≥60% Capactiy rate at 0℃≥×70% 0℃放电容量≥初始容量×70% Capacity rate at 45℃≥100%; 45℃放电容量≥初始容量×100%;
7	K value K 值	25 °C environment, constant current constant voltage charging 0.2 C to 3.92 + / - 0.1 cut-off current 0.01 C 25℃环境下, 以 0.2C 恒流恒压充电至 3.92 ±0.1 截止电流 0.01C	The normal temperature 25 °C for 96 h The high temperature 45 °C for 72 h pressure drop 10 mv or less (Note: to be tested, completion date 2018-11-24) 常温 25℃搁置 96H 高温 45℃搁置 72H 压降≤10mV

5.2 Condition adapting characteristics 环境适应性

No. 序号	Item 项目	Testing Instruction 测试方法	Requirements 标准
1	Static Humidity and Temperature 恒定湿热性能	After Standard Charge, the cell is stored at (40±2)°C and 90%-95%RH for 48hours, then rest for 2hours at (23±2)°C. Standard Discharge to test its retention capacity, and then perform a cycle with Standard Charge and Standard Discharge procedure to test recoverable capacity. 电池标准充电后, 在温度为(40±2)°C, 相对湿度为 90%~95%的条件下开路搁置 48h, 然后在(23±2)°C条件下开路搁置 2h, 目测外观; 标准放电至终止电压, 记录剩余容量; 然后电池进行一次标准充放电循环测试可恢复容量。	Retention Capacity rate ≥80% 剩余容量率≥80% No deformation. No rupture. No smoke. No leakage. 无明显变形、冒烟或破裂, 不漏液。

2	Vibration 振动	<p>After Standard Charging , fixed the cell to vibration table, then subjected to vibration test for 30 minutes per axis of XYZ axes Frequency rate: 1oct/min Vibration frequency: 10Hz-55Hz Excursion (single amplitude): 0.8mm 电芯按标准充电后, 固定在振动台上, 然后沿XYZ 每个坐标方向振动 30 分钟 扫频速率: 1oct/min 振动频率: 10Hz~55Hz 位移幅值(单振幅): 0.8mm</p>	<p>No explosion, no fire , no leakage 不起火、不爆炸、不泄漏。</p>
3	Drop 自由跌落	<p>After Standard Charge, the cell is to be dropped from a height of 1 meter onto concrete board for 6 times,标准充电后的电池从 1.0m 高处自由跌落在到混凝土板上 6 次;</p>	<p>No rupture. No leakage. No fire. No explosion.不破裂、不漏液、不起火、不爆炸。</p>
4	Crush 挤压	<p>After standard charging, a cell is to be crushed between two flat surface, once the maximum pressure has been to 13KN it is to be released 电芯满标准充电后, 用两平板挤压电芯扁平面, 调节挤压力, 压力达到最大值 13±1KN 时停止试验。</p>	<p>No fire, no explosion 无起火、不爆炸</p>

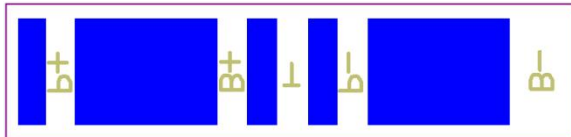
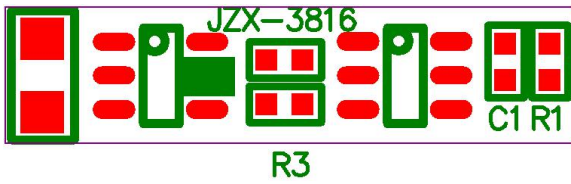
5.3 Safety performance 安全性能

No. 序号	Item 项目	Testing Instruction 测试方法	Requirements 标准
1	Over charge test 过充测试	charging battery with constant current to voltage 4.6V, then with constant voltage 4.6V till current decline to 0. Stop test till battery temperature 10°C lower than max temperature. 在标准测试环境下, 电池用 3C 电流充电至 4.6V, 然后恒压 4.6V 让电流下降接近为 0A, 监视电池温度变化, 当电池温度下降至低于峰值 10°C 时, 停止实验.	No fire, no smoking ,no explosion 无冒烟、无起火、无爆炸。
2	Over discharge test 过放测试	After the battery is fully charged, discharge at 20±5°C conditions with 0.2C5A until the battery voltage drops to the over discharge voltage, then discharge with a 30Ω resister for 24 hours. 电池满充电后, 在 20±5°C 条件下, 以 0.2C 放电至终止电压后, 外接 30Ω 负载放电 24h.	No fire, no smoking ,no explosion. 无冒烟、无起火、无爆炸.
3	Short test 短路测试	Rest for 30minutes at (55 ± 2) °C after Standard Charge, then short-circuit cells by connecting the positive and negative terminals with a circuit load having a resistance load(copper wire) of 80±20mΩ. Test can be terminated when cell surface temperature has returned to ±10°C of environment temperature. 电池标准充电后, 将电池在(55±2)°C 的温度下恒温 30min, 然后用铜导线(总电阻 80±20mΩ) 短接其正负极, 当电池表面温度恢复至高于环境温度 10°C 以内时, 结束实验。	No fire, no smoking ,no explosion. 无冒烟、无起火、无爆炸
4	Heating test 热冲击	The cell is to be heated in a gravity convection or circulating air oven after Standard Charge. The temperature of the oven is to be raised at a rate of 5±2°C per minute to a temperature of 130 ±2°C and remain for 10 minutes. 将标准充电后的电池放入鼓风式烘箱内, 以(5±2)°C /min 的速率由室温升温至(130±2)°C, 并在此温度下恒温 10min。	No fire. No explosion. 电池不起火、不爆炸
5	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, 90 分钟以上	No fire, no smoking ,no explosion. 无冒烟、无起火、无爆炸

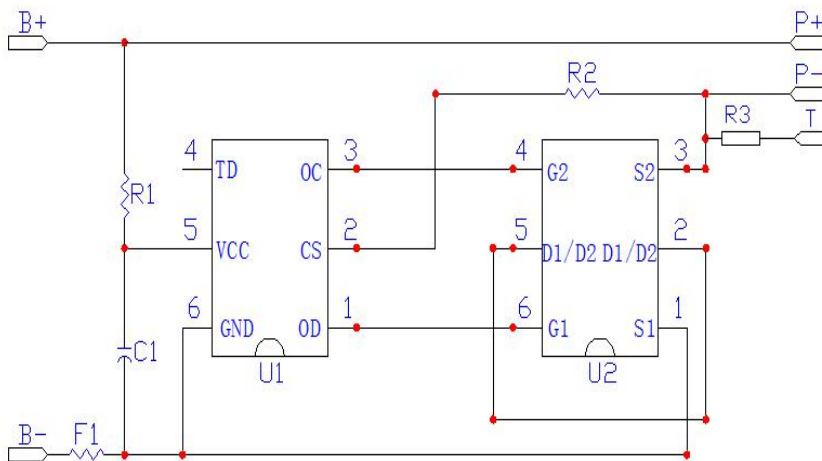
6	<p>Low pressure 低气压测试</p>	<p>Each fully charged cell is placed in a vacuum Chamber, in an ambient temperature of 20~25°C. Once the chamber has been sealed, its internal Pressure is gradually reduced to a pressure equal to or less than 11.6 kpa(this simulates an altitude of 15240 m) held at that value 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°C，真空环境压力≤11.6kpa，模拟 15240m 高空低压环境</p>	<p>No leakage, No fire, No explosion 无泄露，不起火，不爆炸</p>
7	<p>Projectile Test 焚烧试验</p>	<p>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。</p>	<p>Any part of the octagon eight aluminum mesh is not damaged, not out of the batter 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。</p>
8	<p>Soak Test 浸泡测试</p>	<p>Put the fully charged batteries into clean water, be soaked for 24hours. 把满充电的电池放进清水中浸泡 24 小时</p>	<p>No leakage, No fire, No explosion 无泄露，不起火，不爆炸</p>
9	<p>Shock test 撞击测试</p>	<p>The fully charged battery is secured to the testing Machine by means of a rigid mount which will support all mounting surfaces of the cell or battery. The battery is subjected to a total of three shocks of equal magnitude. The shocks are applied in each of three mutually perpendicular directions. At least one of them shall be perpendicular to a flat face. For each shock the cell or battery is accelerated in such a manner that during the initial 3 milliseconds the minimum average acceleration is 75g. The peak acceleration shall be between 125g and 175g. Cells or batteries are tested in an ambient temperature of 20~25°C 在环境温度下，将电池分别按三个轴向固定在测试台面上，前 3ms 内平均加速度最少达到 75g（g 为重力加速度），峰值加速度达 125g 至 175g。测试后观察 6 小时。</p>	<p>No leakage, No fire, No explosion 无泄露，不起火，不爆炸</p>

6.0 protection circuit 保护电路

6.1 PCB Chart PCB 线路图



6.2 Circuit Diagram 电路原理图




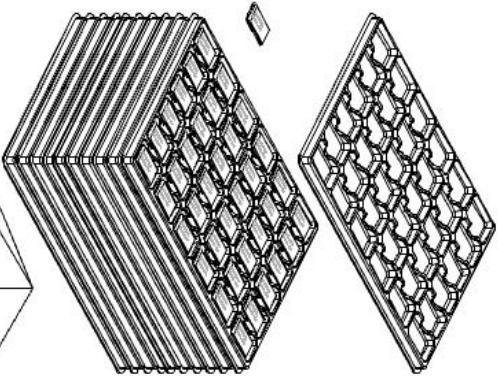
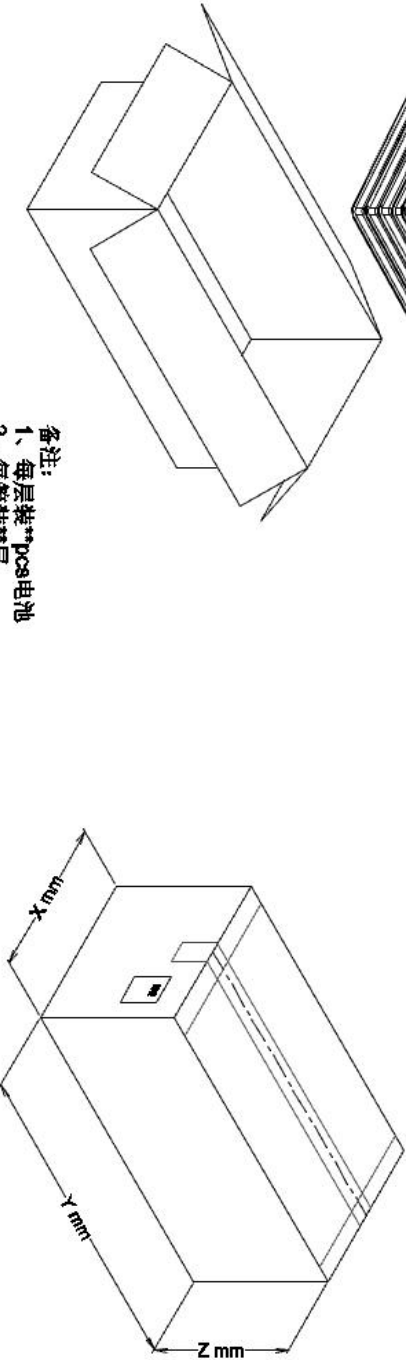
6.3 PCM BOM 保护板单元

NO.	Location 元件编号	Part name 元件名称	Specification 元件规格	Pack type 封装式	Q' ty 数量	Remark 备注
1	U1	Battery protection IC	G3J RoHS	SOT-23-6	1	德普微
2	U2	Silicon MOSFET	8205A RoHS	SOT-23-6	1	德普微
3	R1	Resistance	SMD100Ω ±5% RoHS	0402	1	华新
4	R2	Resistance	SMD2KΩ ±5% RoHS	0402	1	华新
5	C1	Capacitance	SMD 0.1μF RoHS	0402	1	华新
6	R3	NTC	SMD10KΩ ±1% RoHS	0402	1	B=3435 顺络
7	F1	PTC	JK-SMD0805-100	0805	1	
8	B+B-	镍片	4.0*3.0*0.3		2	星光
9	PCB	Print circuit board	16mm*3.8mm*0.6mm FR4 绿油白字 RoHS 长宽厚公差 ±0.1mm 成品厚度: 2.1±0.1mm	铜厚≥10Z	1	路通达

6.4 PCM parameter 保护板参数

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	$4.28 \pm 0.05V$
	tV_{DET1}	Over charge detection delay time 过充电检测延迟时间	1000ms~1600ms
	V_{REL1}	Over charge release voltage 过充电解除电压	$4.08 \pm 0.05V$
Over discharge protection 过放保护	V_{DET2}	Over discharge detection voltage 过放电检测电压	$2.80 \pm 0.05V$
	V_{DET2}	Over discharge release voltage 过放电释放电压	$3.0 \pm 0.05V$ (有休眠功能)
	tV_{DET2}	Over discharge detection delay time 过放电检测延迟时间	115ms~175ms
Over current protection 过流保护	I_{DP}	charging Overcurrent Protection Current 充电过流保护电流	3.5A~6.0A
	I_{DP}	Discharge Overcurrent Protection Current 放电过流保护电流	1.5A~2.5A
	I_{CP}	Over charge current detection current 充电过电流保护电流	6ms~20ms
	tV_{DET3}	Over charge current Detection delay time 放电过电流检测延迟时间	6ms~10ms
		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
	T_{SHORT}	Detection delay time 检测延迟时间	150us~400us
		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 主回路通态内阻	$R_{DS} \leq 150m\Omega$
Current consumption 消耗电流	I_{DD}	Current consume in normal operation 工作时电路内部消耗	7.0 μA Max
Current consumption 消耗电流	I_{DD}	Current consume in normal operation 休眠时电路内部消耗	0.1uA Max
建议工作温度		工作温度	-40°C~85°C
0V 充电		是否可以向 0V 电池充电功能	YES
短路恢复		是否有短路自动恢复功能	YES
休眠功能		是否有休眠功能(有休眠功能的解除条件为充电激活)	YES

7.0 Packing drawing 包装图

					
<p>注意:</p> <p>公差要求(如无标示)</p> <p>1) 没有小数: ±0.5</p> <p>2) 1位小数: ±0.1</p> <p>3) 2位小数: ±0.05</p> <p>4) 单位:mm</p>		<p>备注:</p> <p>1、每层装**pcs电池</p> <p>2、每箱装**层</p> <p>3、每箱最上层装1个空吸塑固定</p>		<p>版本号: _____</p> <p>修订内容 _____</p> <p>日期 _____</p>	
制 定	张 颖 成	日 期	型 号: *****	<p>东莞美尼电池有限公司</p> <p>DONGGUAN MIYEAR BATTERY CO., LTD.</p>	
批 准	张 颖 成	容 量: *****	电 压: *****		
		电 池 类 型: 锂离子电 池	标 题: 包 装 图		
				电 池 类 型: 锂离子电 池	版 本 号: A0

8.0 Quality assurance 质量保证

- Period of warranty: 12 months after sales
质量保证期限：售后 12 个月内
- Miyear company is not responsible for the damage caused by mishandling of the battery which is clearly against the instructions in this specification.
美尼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。

9.0 Matters needing attention 电池使用注意事项

Please be sure to take to comply with the specifications and the following precautions to use with batteries, did not follow the specifications for the operation caused any accidents, Miyear company will not accept any responsibility.

请您务必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，美尼电子有限公司将不承担任何责任

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

Item 项目	Requirement 要求
Short period less than 1 month 短期少于一个月	-20°C ~ +45°C, 65%±25%RH
Long period less than half year 长期小于半年	-20°C ~ + 35°C, 65%±25%RH
Long period less than 1 year 长期小于一年	0°C~+30°C, 65%±25%RH
Storage (At 50% SOC and specified temp, recoverable capacity in % vs time.) 存储(SOC 为 50%并指定)临时，可恢复容量(% vs .时间)。	(12 months, ≥85%) (12 个月, ≥80%) (6 months, ≥85%) (6 个月, ≥85%) (1 month, ≥90%) (1 个月, ≥90%)
20 ± 5°C is the recommended storage temperature 建议贮存温度为 20±5°C	
Long time storage : If the cell is stored for a long time, the cell's storage voltage should be 3.70-3.95V and the cell is to be stored in a condition as above requirement. Also, it is recommended to charge the cell every six months. 长期储存: 如果电池储存时间较长，电池的储存电压应为 3.70-3.95V，电池的储存条件应符合上述要求。此外，建议每六个月给电池充电一次。	

! Danger ! 危险

- Never heat cell or throw it into fire. 严禁把将电池投进火中或进行加热。
- Never throw cell in liquid such as water、 gasoline or drink etc, also do not wet cell 严禁把电池投入液体中，如水、汽油、饮料等，也不要把电池弄湿。
- Prohibition of use cell close to fire or in a car where temperature may be above 60°C . Also do not charge / discharge in such conditions. 禁止在火源附近或温度超过 60°C 的轿车中使用或遗留电池，也不要这些环境中进行充放电。
- Never put batteries in your pockets or a bag together with metal objects such as necklaces, Hairpins, coins, or screws. Do not store or transport batteries with such objects. 禁止把电池同项链、发夹、硬币或螺钉等金属品一起放在兜中或包中，也不要把电池同上述物品一起储存或运输。
- Never short-circuit the (+) and (-) terminals with other metals. 禁止使用金属导体短路电池的正负极。
- Do not place cell in a device with the (+) and (-) in the wrong way around. 在装入设备时注意电池的正负极不要反装。
- Do not pierce cell with a sharp object such as a needle. 禁止使用锐利的物品刺穿电池。
- Do not disassemble the cell. 禁止对电池进行分解。
- Never weld a cell directly. 禁止直接对电池进行焊接。
- Do not use a damaged cell. 禁止使用已经损坏的电池。
- Please carefully read the user's manual prior to use to avoid deteriorated performance, even cell leakage, heat, smoke, fire, explosion due to wrong operations. 在使用之前请仔细阅读操作说明书，不适当的操作可能引起电池变热、着火、爆炸、毁坏或电池容量的衰减。

! Warning ! 警告

- Do not put cell into a microwave oven, dryer, or high-pressure container. 禁止把电池放加热器皿、洗衣机或高压容器中。
- Never use cell with dry cells and other primary batteries. Also do not use mixed cells/batteries with different package, model, or brand. 禁止把电池同干电池或其它原电池或者新旧电池一起使用，也不要同不同包装、不同型号或不同品牌的电池一起使用。
- Stop charging the cell if charging is not completed within the specified time. 如果在规定的充电时间内充电没有结束，停止充电。
- Stop using the cell if abnormal heat, odor, discoloration, deformation or abnormal condition is detected during use, charge, or storage. 在使用、充电或储存期间如发现电池有变热、散发气味、变色、变形或其它反常之处停止使用。
- Keep away from fire immediately when leakage or unpleasant smell is detected. 当发现电池漏液或散发出难闻的气味时立即远离。
- If liquid leaks onto your skin or clothes, wash well with fresh water immediately. 如果电解液渗漏到您的皮肤或衣服上，立刻用大量清水冲洗。
- If liquid leaking from the cell gets into your eyes, do not rub your eyes. Wash them well with fresh water and go to see a doctor immediately. 如果电解液渗出并进入您的眼睛里，不要揉擦您的眼睛，立刻用清水清洗眼睛并就医。

! Caution ! 注意

- Before using the cell, be sure to read the user's manual and cautions on handling thoroughly 在使用电池之前，应仔细阅读操作指南并对使用中的注意事项有足够深刻的理解。
- Charge with specific charger according to product specification. Charge with CC/CV model. Reverse charging is prohibited, for it will deteriorate the cell performance and lead to safety

issues such as heat and leakage. 充电时请使用指定的充电器并按照本规格书的要求进行充电。采用恒流恒压方式充电，禁止反向充电。同时，反向充电会降低电芯的充放电性能和安全性，并会导致发热和泄漏。

- **Keep batteries out of reach of children to avoid being swallowed.**把电池放到小孩够不到的地方以免吞服。
- **If children use the cell, their guardians should explain the proper handling.**小孩使用电池时，监护人应详细解释操作方法。
- **Batteries have life cycles. If cell powers equipment much shorter time than usual, please replace the cell with a new one.**电池具有使用寿命，如果使用电池的设备的工作时间比平常少的多，请更换新电池。
- **When not using cell for long terms, remove it from the equipment and store in a place with low humidity and low temperature.**当长期不用时，要将电池从设备中取出并放在低温低湿的环境中保存。
- **While the cell pack is charged, used and stored, keep it away from places/objects with static electric.**电池应在远离静电的场所进行充电、使用和储存。
- **If the terminals of cell become dirty, clean it with dry cloth before using.**如果电池的接线端变脏，在使用之前用干布擦净。
- **Cell would be over-discharged by its self-discharge characteristics in case the battery is not used for long time. In order to prevent over-discharging, the battery shall be charged periodically to maintain between 3.7V and 3.9V. Cell is to be stored in a condition as above** 由于自放电存在，电芯长时间不使用时将会过放；为避免电芯过放，应定期给电芯充电以维持电压在 3.7V 到 3.9V 之间。同时电芯应在以上给定的条件下存贮。