
Wall Mounted Energy Storage BATTERY PACK Specification

壁挂式储能锂电池组规格书

Model: IBattery-EA-51.2V-200AH

型 号 : IBattery-EA-51.2V-200AH

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目 录

1	Scope/适用范围	3
2	Battery Pack Specification/电池组技术参数	3
3	Battery Management System/电池管理系统	4
3.1	BMS Specification/电池管理系统说明	4
3.2	BMS Protect parameter/电池管理系统保护参数	4
4	Case Structure of PCB 保护板外观	6
4.1	PCB motherboard appearance/PCB 主板外观	6
5	Case Structure of Battery Pack/电池组外观	6
5.1	Structure size and outline drawing/结构尺寸及外形图	6
5.2	Case Structure of Battery Pack 电池组面板结构定义	7
6	Connection mode for parallel communication/并机通讯联接	8
7	LED Indicators/电池 LED 运行状态	9
7.1	LED lights order/LED 顺序	9
7.2	Capacity indicator/容量指示	9
7.3	Flashing instructions/闪动指示	9
7.4	State indicator/状态指示	9
8	Communications specification/通讯说明	10
8.1	RS232 communications/RS232 通讯	10
8.2	RS485-1 communications/RS485-1 通讯	10
8.3	RS485-2 communications/RS485-2 通讯	10
8.4	CAN communications/CAN 通讯	11
8.5	Dial address selection/拨码地址选择	11
9	Battery Testing Equipment and Conditions/电池测试设备及要求	12
9.1	Measurement Apparatus/测试设备要求	12
9.2	Standard Test Condition/标准的测试条件	12
9.3	Rest Period/搁置时间	13
10	Storage and Others/贮存及其它事项	13
10.1	Long Time Storage/长期贮存	13
10.2	Others/其它事项	13
11	Amendment of this Specification/产品规格书的修订	13
12	Appendix (附录)	13
12.1	Preface 前言	13
12.2	Note 1 : 声明一	13
12.3	Note 2 : 声明二	13
12.4	Note 3 : 声明三	14
13	Danger Warning & Caution /危险警告和注意事项!	14

1 Scope/适用范围

The specification shall be applied to Li-ion rechargeable battery pack of 51.2V200AH which is manufactured by our company./本规格书适用于我司生产的 51.2V200AH 锂离子可充电电池.

2 Battery Pack Specification/电池组技术参数

No.	Item/项目	General Parameter/常规参数	Remark/备注
1	Combination method / 组合方式	3.2V100Ah Cell-16S2P	
2	Rated Capacity/ 额定容量	Typical/标称容量	200Ah
		Minimum/ 最小容量	200Ah
3	Factory Voltage/出厂电压	52V-54V	Mean Operation Voltage/即工作电压
4	Voltage at end of Discharge/ 放电终止电压	40V	Discharge Cut-off Voltage/放电截止电压
5	Charging Voltage/充电电压	58.4V	
6	Internal Impedance/ 内阻	≤13mΩ	Internal resistance measured at AC 1KHz after 50% charge/半电态下用交流法测量内阻 The measure must uses the new batteries that within one week after shipment and cycles less than 5 times/使用出货后不到一个星期及循环次数少于 5 次的新电池测量
7	Standard charge/ 标准充电	Constant Current/持续电流: 50A Constant Voltage/持续电压: see No.5 cut-off/截止电流: 0.02C A	Charge time : Approx 1h
	Limiting current/限流充电	10A	
8	Standard discharge/ 标准放电	Constant current/持续电流: 50A end voltage 截止电压: 40V	
9	Maximum Continuous Charge Current/最大充电持续电流	100A	T≥10°C
10	Maximum Continuous Discharge Current/最大放电持续电流	100A	T≥10°C
11	Operation Temperature Range/工作温度范围	Charge (充电) : 0~45°C	Bare Cell/ 单体电池 储存湿度范围 60±25%R.H.
		Discharge (放电) : -20~55°C	
12	Storage Temperature Range/储存温度范围	Less than 8 months/ ≤ 8 月 : -10~35°C	at the shipment state /出货状态时的湿度范围 60±25%R.H.
		less than 3 months/ 小于 3 个月 : -10~45°C	
		Less than 7 day/小于 7 天: -20~65°C	
13	Weight/重量	87±3Kg	Include case

	14	Cycle life/循环寿命	≥6000 times	80%DOD-0.2C/0.5C Charger/Discharge25°C 80%DOD-0.2C/0.5C 充放 25°C
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3 Battery Management System/电池管理系统

3.1 BMS Specification/电池管理系统说明

1) The BMS is designed for 8~16 series lithium battery./BMS 为 8~16 串锂离子电池设计

2) The BMS have all functions which are /该 BMS 系统具有以下一些功能:

- ◆ overcharge detection function/过充电保护功能
- ◆ over discharge detection function/过放电保护功能
- ◆ over current detection function/过电流保护功能
- ◆ short detection function/短路保护功能
- ◆ Temperature detection function/温度保护功能
- ◆ balance function/均衡功能
- ◆ communicate function/通讯功能
- ◆ Alarm function/告警功能
- ◆ Total capacity function/总容量功能
- ◆ Storage history function/存储历史记录功能

3.2 BMS Protect parameter/电池管理系统保护参数

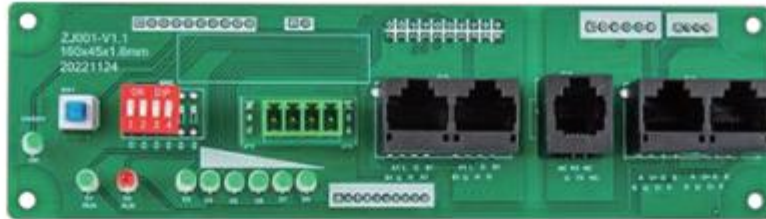
15/16S 磷酸铁锂保护线路模块设定 Typical value specifications

Items	Details	Standard
Cell overcharge protection	Overcharge detection voltage	3.65±0.025V
	Overcharge detection delay time	Typical:1.0s
	Overcharge release voltage	3.45±0.02V
	Overcharge release conditions	1. The monomer voltage drops to the overcharge recovery point 2. The remaining capacity is 96% lower than the intermittent power supply capacity Two conditions must be met in order to resume Battery discharge current ≥1A detected
Cell over-discharge protection	Over-discharge detection voltage	2.6±0.02V
	Over-discharge detection delay time	Typical:2.0s
	Over-discharge release conditions	2.95±0.02V Battery charge current ≥1A detected
Over-current protection	discharge Over-current protection current	110±10A
	discharge Over-current detection delay time	1S
	discharge Over-current release conditions	Restore immediately after charging, or automatically recover after 60 seconds
	Transient discharge Over-current protection current	125±10A
	Transient discharge Over-current protection current delay time	100mS
	Charge OC protection current	110±10A

	charge Over-current detection delay time	2S
	charge Over-current release conditions	Discharge recovery immediately, or automatic recovery after 300S
Effective charging current	Charging entry current	800mA
	Charge exit current	500mA
Effective dischar. current	Discharging entry current	800mA
	Discharge exit current	400mA
Short protection	Short protection current	500±100A
	Protection condition	Load short
	Detection delay time	≤350μs
	Protection release condition	Charging release or Restart recovery
Temperature(T) protection	Charge high T protection	65±5°C
	Charge high T recover	55±5°C
	Discharge high T protection	65±5°C
	Discharge high T recover	60±5°C
	Charge low T protection	-10±5°C
	Charge low T recover	-1±5°C
	Discharge low T protection	-20±5°C
	Discharge low T recover	-10±5°C
Balance	Balance threshold voltage	3.40V
Alarm of cell failure	Core failure differential pressure	800mv
	The cell recovers differential pressure	500mv
Battery capacity setting	Battery rated capacity	100AH
	Cyclic accumulative capacity	80% Number of cycles (adjustable)
	Remaining capacity alarm	15%
	Residual capacity protection	5%
Reset button	Power on/Activate	BMS is in hibernation state, press 1S reset button, BMS will be activated, and the LED indicator will turn on in turn, and then turn into normal working state;
	Shutdown/Hibernate	When the BMS is in standby or working state (except charging), press the 3S reset button, and the BMS will sleep. After the LED indicator lights up one by one, the BMS will go to sleep state.
Power dissipation	Normal operating power consumption	≤15mA, ≤20mA(with LCD on)
	The power consumption of the dormant	≤40uA
BMS power management	Maximum standby time	24h (Charger is not available and there is no effective discharge current)
Prefilled function	2000ms Prevent short circuit at the moment of opening	
Communication	It has CAN and RS485 and RS23 standard communication interface, it can real-time monitoring the capacity of battery bank, the voltage, current, environment temperature, and charging/discharging current.	
Internal resistance	< 5mΩ	
LCD screen	Simplified monitoring software, can view the cell, temperature, current and other data	
Alarm	It has over-temperature, over charge, under-voltage, over-current, short circuit alarm	

4 Case Structure of PCB 保护板外观

4.1 PCB motherboard appearance/PCB 主板外观



5 Case Structure of Battery Pack/电池组外观

There shall be no such defect as scratch, bur and other mechanical scratch, and the connector should be no rust dirt. The structure and dimensions see attached drawing of the battery. /电池的表面应无明显的划痕毛刺及其其它机械划伤，外露的金属端子应无锈蚀污垢。

5.1 Structure size and outline drawing/结构尺寸及外形图

Our company is a company with a complete set of design and manufacturing technologies and capabilities, which can be integrated according to customer requirements and different manufactures of Cell&BMS resources to form a customer unique products. 我司是一家具有完整的设计和制造技术与能力的公司，可以依据客户的要求以及不同厂家的电芯&BMS 资源进行整合，形成客户独有的产品。



Length 长度: 839mm, Width 宽度: 486mm, Thickness 厚度: 154mm

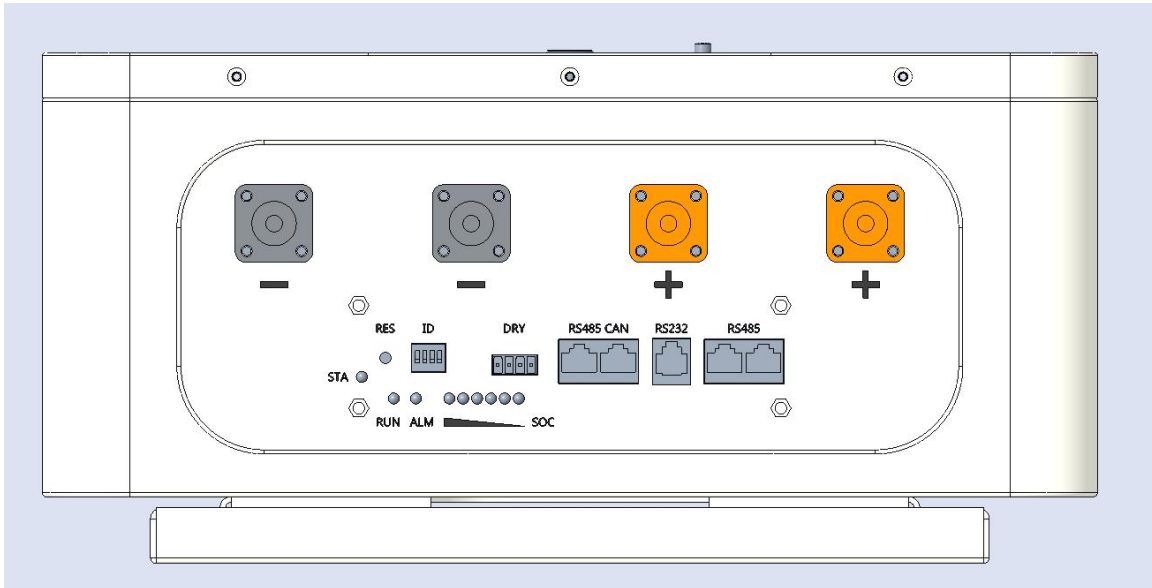
Design Style 1/设计款型 1: 仅供参考 (The image is only a reference)

5.2 Case Structure of Battery Pack 电池组面板结构定义

Front View 正面视图 :



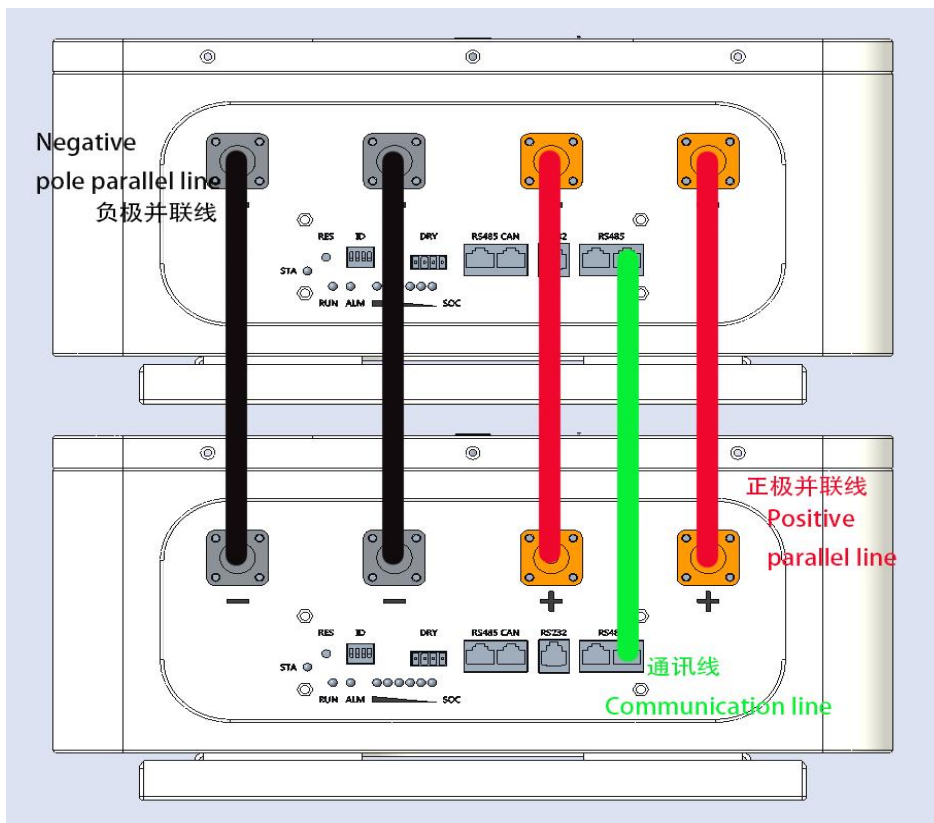
Bottom View



仅供参考 (The image is only a reference)

6 Connection mode for parallel communication/并机通讯联接

The RS485-2 interface serves as the parallel communication interface and RS 485-2 interface serves as the upper communication interface. The terminal device CAN read the sum of all battery data in parallel with the PACK through the RS 485-1 interface. 多机并联时 RS485-2 接口作为并机通信接口, RS485-1 接口作为上联通信接口。终端设备可以通过 RS485-1 接口读取所有并联 PACK 的电池数据的总和。









仅供参考 (The image is only a reference)










7 LED Indicators/电池 LED 运行状态

7.1 LED lights order/LED 顺序

1 operation light, 1 alarm light, 4 capacity indicator lights

					
SOC				ALARM	RUN







7.2 Capacity indicator/容量指示

Condition		Charge				Discharge			
Capacity indicator lamp		L1 	L2 	L3 	L4 	L1 	L2 	L3 	L4 
	0-25%	Flash2	OFF	OFF	OFF	ON	OFF	OFF	OFF
	25-50%	ON	Flash2	OFF	OFF	ON	ON	OFF	OFF
	50-75%	ON	ON	Flash2	OFF	ON	ON	ON	OFF
	≥75%	ON	ON	ON	Flash2	ON	ON	ON	ON
Running indicator light 		ON				Flash			

7.3 Flashing instructions/闪动指示

Flashing way	ON	OFF
Flashing 1	0.25S	3.75S
Flashing 2	0.5S	0.5S
Flashing 3	0.5S	1.5S

7.4 State indicator/状态指示

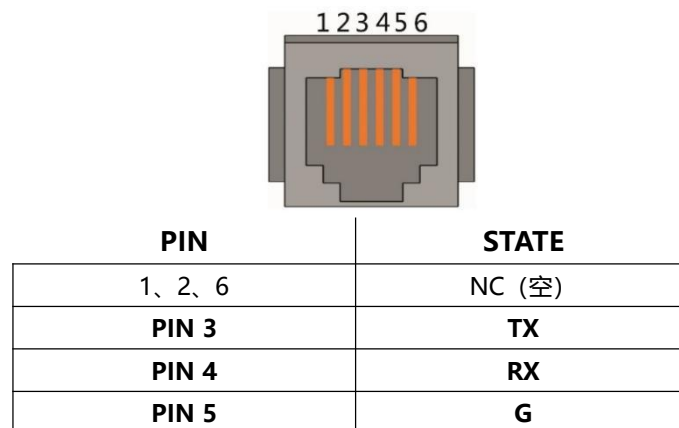
Status	Normal/Warning/Protection	RUN	ALM	Capacity (SOC) LED				Description	
									
Shut Down	Shut down	OFF	OFF	OFF	OFF	OFF	OFF	All OFF	
Standby	Normal	Flash	OFF	Based on capacity				Standby	
	Warning	Flash	Flash						
Charge	Normal	ON	OFF	Based on capacity				ALM light does not flash when overcharge alarm	
	Warning	ON	Flash						
	Over Charge Protection	ON	OFF	ON	ON	ON	ON	Switch to standby when there is no charging	
	Temperature, Current, Failure protection	OFF	ON	OFF	OFF	OFF	OFF	Stop charging	
Discharge	Normal	Flash	OFF	Based on capacity					
	Warning	Flash	Flash						
	Over discharge protection	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging	
	Temperature, Over current, Short circuit, Reverse connection, Failure protection	OFF	ON	OFF	OFF	OFF	OFF	OFF	Stop discharging
Fault	/	OFF	ON	OFF	OFF	OFF	OFF	OFF	Stop charging or discharging

8 Communications specification/通讯说明

8.1 RS232 communications/RS232 通讯

The BMS has RS232 communication with PC, and the baud rate is 9600 bps. RS232 communication interface uses RJ12 network cable interface [6P6C]./BMS 具备电池组数据上传和参数修改设置的 RS232 通讯功能，通过 RS232 端口可以与上位机软件通信，波特率默认值为 9600bps，RS232 通信接口为 RJ12 网络端口 [6P6C]。

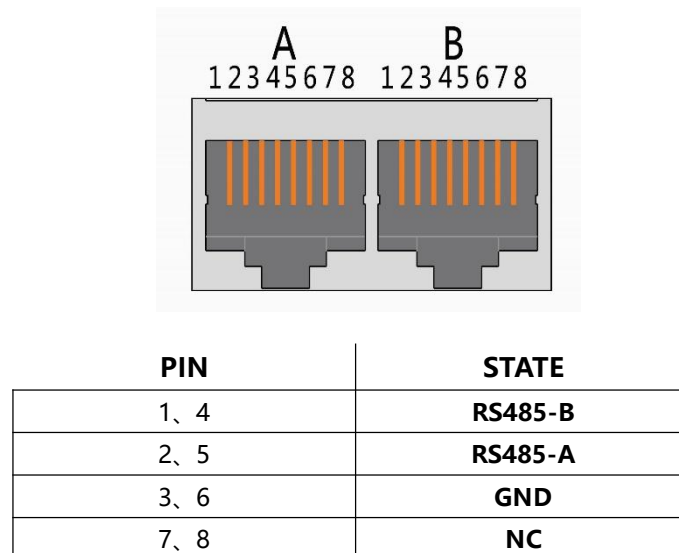
RS232 communication interface definition:



8.2 RS485-1 communications/RS485-1 通讯

The BMS has RS485-1 communication with Inverter, and the baud rate is 9600 bps. RS485 communication interface uses RJ45 network cable interface. /BMS 具备电池组数据与逆变器交互通信的 RS485-1 通讯功能，波特率默认值为 9600bps，RS485-1 通讯接口为 RJ45 网络接口。

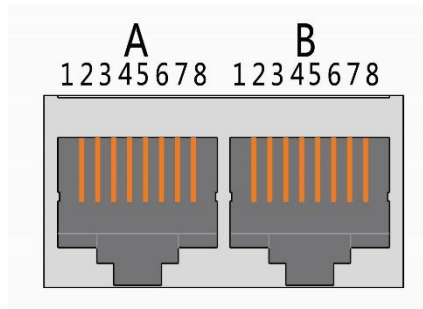
RS485-1 communication interface definition:



8.3 RS485-2 communications/RS485-2 通讯

The BMS has RS485 communication with battery pack, and the baud rate is 9600 bps. RS485 communication interface uses RJ45 network cable interface./BMS 具备电池组级联通信功能的 RS485-2 通讯功能，波特率默认值为 9600bps，RS485-2 通信接口为双 RJ45 网络端口。

RS485-2 communication interface definition:

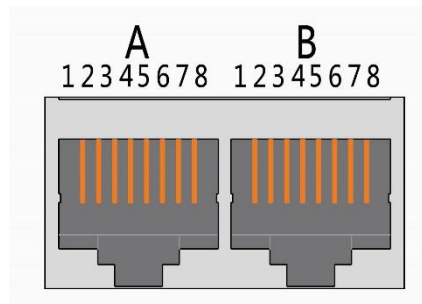


PIN	STATE
1、8	RS485-B
2、7	RS485-A
3、6	GND
4、5	NC

8.4 CAN communications/CAN 通讯

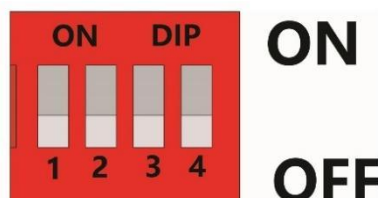
BMS has CAN communication function with inverter or CAN TEST, baud rate of 500K. CAN communication interface uses RJ45 network cable interface. /BMS 具备电池组数据与逆变器交互通信的 CAN 通讯功能，波特率默认值为 500Kbps, CAN 通讯接口为 RJ45 网络端口。

CAN communication interface definition:



PIN	STATE
1、5	CAN-L
4、8	CAN-L
2、7	GND
6	NC (空)

8.5 Dial address selection/拨码地址选择



Definition of parallel machine dialing switch: multi-machine communication when the battery Pack is in parallel. The dial switch is used to distinguish the different PACK addresses. The hardware address can be set by the dial switch on the board.

在电池组作并联时的多机通信，使用拨码开关区分不同 Pack 地址，硬件地址可通过板上的拨码开关设置。

Battery pack with address 1 will be main battery, other batteries will be slave. Main battery will collect all the data and information in this parallel system. Only main battery can communicate with Invert or PC through RS485-1 or CAN.

在电池组级联时，通信地址为 1 的称为主电池组，其余通信地址的称为从电池组。从电池组可以通过 RS485 通信接口与主电池组通信，主电池组将本级联系统中每个电池组的数据集中打包管理。在电池组级联时，只有主电池组可以与上位机通信。

Use address Settings for stand-alone machines/单机使用地址设置：0000

Address setting for parallel machine: refer to the following table for the definition of dialing switch
并机使用地址设置：拨码开关的定义参照下表

Battery Pack Address/锂电池组地址拨码

Address/地址	Dial code switch position/拨码开关位置				Explain/说明
	1#	2#	3#	4#	
1	OFF	OFF	OFF	OFF	Pack1
2	ON	OFF	OFF	OFF	Pack2
3	OFF	ON	OFF	OFF	Pack3
4	ON	ON	OFF	OFF	Pack4
5	OFF	OFF	ON	OFF	Pack5
6	ON	OFF	ON	OFF	Pack6
7	OFF	ON	ON	OFF	Pack7
8	ON	ON	ON	OFF	Pack8
9	OFF	OFF	OFF	ON	Pack9
10	ON	OFF	OFF	ON	Pack10
11	OFF	ON	OFF	ON	Pack11
12	ON	ON	OFF	ON	Pack12
13	OFF	OFF	ON	ON	Pack13
14	ON	OFF	ON	ON	Pack14
15	OFF	ON	ON	ON	Pack15
16	ON	ON	ON	ON	Pack16

9 Battery Testing Equipment and Conditions/电池测试设备及要求

9.1 Measurement Apparatus/测试设备要求

(1) Dimension Measuring Instrument 尺寸测量设备

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm. 测量尺寸的仪器的精度应不小于 0.01mm

(2)Voltmeter 电压表

Standard class specified in the national standard or more sensitive class having inner impedance not less than 10 K Ω /V. 国家标准或更灵敏等级，内阻不小于 10 K Ω /V.

(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 0.01 Ω . 国家标准或更灵敏等级，外部总内阻包括电流表和导线应小于 0.01 Ω .

(4) Impedance Meter 内阻测试仪

Impedance shall be measured by a sinusoidal alternating current method (AC 1kHz LCR meter). 内阻测试仪测试方法为交流阻抗法(AC 1kHz LCR).

9.2 Standard Test Condition/标准的测试条件

Test should be conducted with new batteries within one month after shipment from our factory and the

cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of $23\pm 2^{\circ}\text{C}$ and relative humidity of less 75%, air 86Kpa~106Kpa. 测试电池必须是本公司出厂时间不超过一个月的新电池, 且电池未进行过五次以上充放电循环。除非其它特殊要求, 本产品规格书规定的测试的环境条件为: 温度 $23\pm 2^{\circ}\text{C}$, 相对湿度 $\leq 75\%$, 气压 86Kpa~106Kpa.

9.3 Rest Period/搁置时间

Unless otherwise defined, 30min, rest period after charge, 30min, rest period after discharge. 如无特殊要求, 电池充放电间隔为 30min。

10 Storage and Others/贮存及其它事项

10.1 Long Time Storage/长期贮存

If stored for a long time (don't used, exceed three months), the cell should be stored in drying and cooling place. The cell's storage voltage should be 3.18~3.32V per cell. and the cell is to be stored in a condition that the temperature of $23\pm 2^{\circ}\text{C}$ and the humidity of 45%- 75%. Long-term use of unused batteries to recharge every 3 months. Ensure that the battery voltage is within the above range. /长期贮存的电池(未使用,超过 3 个月)须置于干燥、凉爽处。贮存电压为 3.18~3.32V/串。储存于 $23\pm 2^{\circ}\text{C}$, 湿度为 45%-75% 的洁净环境。长期搁置未使用电池每 3 个月补电一次, 确保电池电压在上述范围内。

10.2 Others/其它事项

Any matters that this specification does not cover should be conferred between the customer and TOPAK/任何本规格书中未提及的事项, 须经双方协商确定

11 Amendment of this Specification/产品规格书的修订

This specification is subject to change with prior notice. 本公司有权对本产品规格书进行修订。

12 Appendix (附录) Handling Precautions and Guideline For Li-ion Rechargeable Batteries/锂离子充电电池操作指示及注意事项

12.1 Preface 前言

This document of 'Handling Precautions and Guideline Li-ion Rechargeable Batteries' shall be applied to the battery cells manufactured by our company. 本档“锂离子充电电池操作指示及注意事项”仅适用于我司生产电池。

12.2 Note 1 : 声明一

The customer is requested to contact our company in advance, if and when the customer needs other applications or operating conditions than those described in this document. Additional experimentation may be required to verify performance and safety under such conditions. 客户若需要将电池用于超出本规格书规定以外的设备, 或在本规格书规定以外的使用条件下使用电池, 应事先联系我司, 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。

12.3 Note 2 : 声明二

Our company will take no responsibility for any accident when the cell is used under other conditions than those described in this Document. 对于在超出本规格书规定以外的条件下使用电池而造成的任何意外事

故，我司概不负责。

12.4 Note 3 : 声明三

Our company will inform, in a written form, the customer of improvement(s) regarding proper use and handling of the cell, if it is deemed necessary. 如有必要，我司会以书面形式告知客户有关正确操作使用电池的改进措施。

13-Danger Warning & Caution /危险警告和注意事项!

- Do not immerse the battery in water or allow it to get wet. 勿将电池投入水中或将其弄湿!
- Do not use or store the battery near sources of heat such as a fire or heater. 禁止在火源或极热条件下给电池充电! 勿在热源（如火或加热器）附近使用或贮存电池! 如果电池泄漏或发出异味，应立即将其从接近明火处移开;
- Do not use any chargers other than those recommended. 请使用专用充电器!
- Do not reverse the positive (+) and negative (-) terminals. 勿将正负极接反!
- Do not connect the battery directly to wall outlets or car cigarette-lighter sockets. 勿将电池直接连接到墙上插座或车载点烟式插座上!
- Do not put the battery into a fire or apply direct heat to it. 勿将电池投入火中或给电池加热!
- Do not short-circuit the battery by connecting wires or other metal objects to the positive (+) and negative (-) terminals. 禁止用导线或其它金属物体将电池正负极短路，禁止将电池与项链、发夹或其它金属物体一起运输或贮存!
- Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it. 禁止用钉子或其它尖锐物体刺穿电池壳体，禁止锤击或脚踏电池!
- Do not strike, throw or subject the battery to sever physical shock. 禁止撞击、投掷或者使电池受到机械震动
- Do not directly solder the battery terminals. 禁止直接焊接电池端子!
- Do not attempt to disassemble or modify the battery in any way. 禁止以任何方式分解电池!
- Do not place the battery in a microwave oven or pressurized container. 禁止将电池置入微波炉或压力容器中!
- Do not use the battery in combination with primary batteries (such as dry-cell batteries) or batteries of different capacity, type or brand. 禁止与一次电池（如干电池）或不同容量、型号、品种电池组合使用!
- Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way. If the battery is in use or being recharged, remove it from the device or charger immediately and discontinue use. 如果电池发出异味、发热、变形、变色或出现其它任何异常现象时不得使用; 如果电池正在使用或充电，应立即从用电器中或充电器上取出并停止使用!
- Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life. 不要使用处于极热环境中的电池，如阳光直射或热天的车内。否则，电池会过热，可能着火（点燃），这样就会影响电池的性能、缩短电池的使用寿命。
- If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury. 如果电池漏液后电解液进入眼睛，不要擦，应用水冲洗，立即寻求医疗救助。如不及时处理，眼睛将会受到伤害。

——规格资料已结束 That is the all.——