东莞市百维科技有限公司

### DONG GUAN SHI BESTWAY TECHNOLOGY CO。，LTD

产 品 承 认 书

### SPECIFICATION FOR APPROVAL

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 产品名称 | **BWPB-534-20S-60A-01XX-6002B3G** | | | | | | | |
| 客户物料 |  | | | | | | | |
| 客 户：  CUSTOMER |  | | | 送样日期：  DATE | | 2020.10.05 | | |
| 品 名：  DESCRIPTION | 20 节磷酸铁锂电池组保护板  Protect Board of 20 Cell LI-FePO4 Battery Back | | | | | | | |
| 版本号： |  | 文件编号： |  | | | | 页数 | 6 |
| 核 准：  APPROVED | | 审 核：  VERIFIED | | | 制 作：  PREPARED | | | |
|  | |  | | | 肖永祥 | | | |
| 客户确认栏 | | | | | | | | |
| 确认意见：  签章： 日期： | | | | | | | | |
| 注明: 受市场供货影响，本公司有可能在不通知道客户的情况下变更主要器件，产品的  可靠性不变或更优。如果您的产品经过认证，请提前通知本公司。  Note: Affected by market supply, the company may change the main components without knowing the customer, and the reliability of the product will remain unchanged or better. If your product is certified, please notify the company in advance. | | | | | | | | |

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1. **概述Overview**

此规格书定义了东莞市百维科技有限公司（后文简称“我司”）根据贵公司提供的设计要求，设计并制造的电池组管理系统的功能、电气参数、机械参数及包装运输和安装使用方法。经贵公司确认生效，此规格书仅限我司及贵公司内部使用，未经我司许可不得给予第三方，且我司拥有对此规格书的最终解释权。

This specification defines the functions, electrical parameters, mechanical parameters, packaging, transportation and installation of the battery pack management system designed and manufactured by Dongguan BestWay Technology Co., Ltd. (hereinafter referred to as "our company") according to the design requirements provided by your company Instructions. After confirmation by your company, this specification is for internal use by our company and your company, and cannot be given to third parties without our permission, and our company has the final right to interpret this specification.

## 编号详解Detailed number：

BWPB - 534 - 20S - 60A - 01XX - 6002B3G

⑴ ⑵ ⑶ ⑷ ⑸ (6)

1. BWPB：表示百维动电池保护板 BestWay PB BMS
2. 534：表示我司机板型号 Indicates the model
3. 20S : 表示电池节数 Indicates the number of battery cells
4. 60A: 表示持续放电电流 Indicates continuous discharge current
5. 01K1496: 分二段：01：表示充放电共用端口（不带外围控制电路）Indicates the common port for charging and discharging (without peripheral control circuit)
6. XX: 表示客户代码。Represents the customer code.
7. 6002B3G: 分二段：60： 表示充电电流60A.Represents charging current 60A

02B3G: 表示主控IC的流水编码（带均衡有温控功能）Indicates the flow code of the main control IC (with balance and temperature control function)

* 贵司收到规格书和样品后，验证测试完成，如果需要后续批量，请签署此份规格书后， 并将此份规格书回传至我司，我司会按照此份规格书参数，给贵司批量。
* After your company receives the specifications and samples, the verification test is completed. If you need subsequent batches, please sign this specification and return this specification to our company. Our company will produce according to the specifications of this specification.

# 特别说明Special Note:

* 客户收到样品后请及时组织测试,并将测试结果反馈回我公司,以方便我公司安排本项目的后续工作.5 天之内未作任何答复的,公司默认为客户测试合格,本项目正常结束.
* After the customer receives the sample, please organize the test in time and feed back the test result to our company to facilitate our company to arrange the follow-up work of this project. If there is no reply within 5 days, the company defaults to the customer's test. The project ends normally.
* 客户测试合格,请在客户意见栏目标明产品名称以及产品代码,并盖章签名确认,否则请在测试不合格栏目中指出问题所在,提出改进建议.
* If the customer passed the test, please specify the product name and product code in the customer comment column, and stamp and sign for confirmation, otherwise, please point out the problem in the unqualified column and make suggestions for improvement.
* 我公司在收到经过客户签章的原件并附上产品说明详细功能说明后,才能接收订单
* Our company can only receive orders after receiving the original signed and sealed by the customer and attaching the detailed function description of the product description.

## **基本参数Basic parameters**

* 1. 应用及特点 Application and features:：
* 适用于 20 节串联磷酸铁锂电池组；
* Suitable for 20 series lithium iron phosphate battery packs;
* 完善的过充保护、过放保护、过流保护及短路保护功能 ；
* Perfect overcharge protection, overdischarge protection, overcurrent protection and short circuit protection functions;
* 主控 IC 采用高集成度的专用电池保护 IC，具有保护功能可靠稳定，自损耗低及防ESD。
* The main control IC adopts a highly integrated dedicated battery protection IC, which has reliable and stable protection functions, low self-loss and anti-ESD.
  1. 基本性能 Basic performance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **项目**  **No.,** | **描述**  **Description** | **最小值**  **Min.** | **典型值**  **Typ.** | **最大值**  **Max.** | **单位**  **Unit** |
| 1 | 充电电压Charging voltage | 92.2 | 92.4 | 92.6 | V |
| 2 | 充电 MOS 管耐压值  MOSFET withstand voltage value during charging | / | / | 135（DC） | V |
| 3 | 放电 MOS 管耐压值  MOSFET withstand voltage value during discharging | / | / | 135（DC） | V |
| 4 | 正常电流最高温升  Max. temperature rise of normal current |  | 45 | 60 | ºC |
| 5 | 工作环境温度范围  Working environment temperature range | -20 | 25 | 65 | ºC |
| 6 | 保存环境温度范围  Storage temperature range | 20 | 25 | 30 | ºC |
| 7 | 放电 MOS 管端保护温度  MOSFET end protection temperature during discharge | 80 | 85 | 90 | ºC |
| 8 | 电池包温度保护  Battery pack temperature protection | / | / | / | ºC |
| 9 | 保存环境湿度范围  Storage environment humidity range | ≤40% | | | |

* 1. 结构参数**Structural parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **项目 Item** | **描述Description** | **标准 Size** | **单位Unit** |
| **PCM 尺寸 size** | **L\*W\*H** | **150\*60\*16** | **mm** |
| **排线尺寸 Cable size** | **AWG24 排线 cable** | **/** | **mm** |

#### B-TP1）：接电池组的负极(硅胶线/UL3135/黑色/12AWG/L=150±5mm\*2PCS)

#### B-Negative pole connected to battery pack (Silica gel wire /UL3135/ black /12AWG/L=150±5mm\*2PCS)

#### CH-/ （ P- ） ： 接充电器的负极/ 放电负载的负极( 硅胶线/UL3135/ 蓝色

#### /12AWG/L=150±5mm\*2PCS)

* CH-/ (P-): Connect the negative pole of the charger/the negative pole of the discharge load (silica gel cable/UL3135/ blue
* 电压检测线（排线即信号线）Voltage detection line (the cable is the signal line):：

1. 保护板 20PIN 排线从最左边开始（从左到右）依次为 The protection board 20PIN cable starts from the leftmost (from left to right) in order : B1+/B2+/B3+/B4+/B5+/B6+/B7+/B8+/B9+/B10+/B11+/B12+/B13+/B14+/B15+/B16+/B17+/B18+B19+B20+(B+)
2. UL1007 24AWG 长 L=500±5mm B1-B20：红色 ; UL1007 24AWG Length L=500±5mm B1-B20: Red

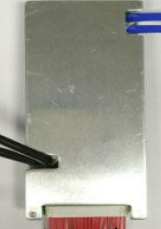
* **以上线材配置为客户标准配置或第一次下定单时所要求之配置，客户在不同定单不同批量中要求可能不同，届时请以当次定单当次批量实际要求为准**
* The above wire configuration is the customer's standard configuration or the configuration required when placing an order for the first time. Customers may have different requirements in different orders and different batches. Please refer to the actual batch requirements of the current order.

1. **功能参数 Function parameters**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **功能**  **Function** | | **测试项目**  **Testing Item** | **符号**  **Symbol** | **测试条件**  **Testing condition** | **规格**  **Specification** | | | **单位**  **Unit** |
| **最小值**  **Min.** | **典型值**  **Typ.** | **最大值**  **Max.** |
| **保护功能** | 过充保护  Overcharge protection | 过充保护电压  Overcharge protection voltage | Vc1 | At charge off | 3.80 | 3.85 | 3.90 | V |
| 保护延时时间  Protection delay time | Tc1 | / | 0.5 | 1.0 | 2.0 | S |
| 保护恢复电压  Protection recovery voltage | Vc2 | / | 3.60 | 3.65 | 3.70 | V |
| 恢复条件  Recovery conditions | 所有单体电池电压下降至过充恢复电压The voltage of all single cells drops to the overcharge recovery voltage | | | | | |
| 充电电流  Charging current | 正常充电电流  Normal charging current | Ioc | / | / | / | 60 | A |
| 过放保护  Over discharge protection | 过放保护电压  Over discharge protection voltage | Vd1 | At discharge  off | 2.22 | 2.30 | 2.38 | V |
| 保护延时时间  Protection delay time | Td1 | / | 0.5 | 1.0 | 2.0 | S |
| 保护恢复电压  Protection recovery voltage | Vd2 | / | 2.40 | 2.50 | 2.60 | V |
| 恢复条件  Recovery conditions | 断开放电负载且所有单体电池电压上升至过  放恢复电压; Disconnect the discharge load and the voltage of all single cells rises to the over-discharge recovery voltage | | | | | |
| 过流保护  Overcurrent protection | 过流保护  Overcurrent protection | Ioc1 | / | 150 | 180 | 210 | A |
| 保护延迟时间  Protection delay time | Toc1 | / | 300 | 700 | 1200 | mS |
| 放电过流解除  Discharge overcurrent release | 恢复条件  Recovery conditions | / | 断开负载，自动恢复  Disconnect load, automatic recovery | | | | |
| 放电电流  Discharge current | 持续放电电流  Continuous discharge current | Ioc | / | / | / | 60 | A |
| 短路保护  Short circuit protection | 保护延迟时间  Protection delay time | Tshort | / | 200 | 800 | 3000 | uS |
| 短路保护恢复  Short circuit protection recovery | / | 断开负载，自动恢复  Disconnect load, automatic recovery | | | | |
| 内阻  Resistance | 放电回路内阻  Resistance of discharge circuit（mΩ） | Ron1 | / | / | 15 | 50 | mΩ |
| 自耗电  Self-consumption | 单节自耗电流  Single self-consumption current | Icc1 | / | / | 25 | 60 | uA |
| 平衡功能  Balance function | | 单节平衡电压  Single cell balance voltage | / | / | 3.50 | 3.60 | 3.70 | V |
| 单节平衡电流  Single cell balance current | / | / | 10 | 20 | 30 | mA |

* 特别注意：由于仪器的测试引线和连接器一定内阻，50mA 均衡电流会在引线上带来压降， 内阻越大或均衡电流越大，压降带来的测试误差越大。上述范围仅供参考。实际保护板上IC 的动作点是在中心值附近。即便如此，建议电池组上使用的信号线还是要尽量短。
* Special attention: due to the certain internal resistance of the test lead and connector of the instrument, the 50mA equalization current will bring a voltage drop on the lead. The greater the internal resistance or the greater the equalization current, the greater the test error caused by the voltage drop. The above range is for reference only. The operating point of the IC on the actual protection board is near the center value. Even so, it is recommended that the signal line used on the battery pack is as short as possible.
* 备注：测试条件：测试所用电池必须为生产时间不超过 1 周的新电池。除特别说明外,测试需在温度 23±2℃, 相对湿度 65+/-20% 的室内进行。做短路测试时请用 20AH 的电池包.
* Note: Test conditions: The battery used in the test must be a new battery with a production time of no more than 1 week. Unless otherwise specified, the test should be performed indoors at a temperature of 23±2°C and a relative humidity of 65+/-20%. Please use 20AH battery pack for short circuit test.

1. **实物图片Sample picture（参考）：**



C-（P-）：接充电器的负极和放电负载负极

C-(P-): Connect the negative pole of the charger and the negative pole of the discharge load.

B-：接电池组的负极

B-: Connect the negative pole of the battery pack.

B1------ B20

**端口说明 Port description:**

|  |  |  |  |
| --- | --- | --- | --- |
| B- | 接电池组负极  Connect the negative pole of the battery pack | B11 | 接电池组第 11 串正极  Connect the 11th string positive of the battery pack |
| C-(P-) | 接充电器的负极和放电负载的负极  Connect the negative pole of the charger and the negative pole of the discharge load | B10 | 接电池组第 10 串正极  Connect the 10th string positive of the battery pack |
| B20 | 接电池组第 20 串正极  Connect the 20th string positive of the battery pack | B9 | 接电池组第 9 串正极  Connect the 9th string positive of the battery pack |
| B19 | 接电池组第 19 串正极  Connect the 19th string positive of the battery pack | B8 | 接电池组第 8 串正极  Connect the 8th string positive of the battery pack |
| B18 | 接电池组第 18 串正极  Connect the 18th string positive of the battery pack | B7 | 接电池组第 7 串正极  Connect the 7th string positive of the battery pack |
| B17 | 接电池组第 17 串正极  Connect the 17th string positive of the battery pack | B6 | 接电池组第 6 串正极  Connect the 6th string positive of the battery pack |
| B16 | 接电池组第 16 串正极  Connect the 16th string positive of the battery pack | B5 | 接电池组第 5 串正极  Connect the 5th string positive of the battery pack |
| B15 | 接电池组第 15 串正极  Connect the 15th string positive of the battery pack | B4 | 接电池组第 4 串正极  Connect the 4th string positive of the battery pack |
| B14 | 接电池组第 14 串正极  Connect the 14th string positive of the battery pack | B3 | 接电池组第 3 串正极  Connect the 3rd string positive of the battery pack |
| B13 | 接电池组第 13 串正极  Connect the 13th string positive of the battery pack | B2 | 接电池组第 2 串正极  Connect the 2nd string positive of the battery pack |
| B12 | 接电池组第 12 串正极  Connect the 12th string positive of the battery pack | B1 | 接电池组第 1 串正极  Connect the 1st string positive of the battery pack |

* 注意：串数不同接线方式不同，同口分口接线方式也不同，不要接错或接反，否则会损坏元件
* Note: The connection method is different for different serial numbers, and the connection method of the same port is also different. Do not connect the wrong or reverse connection, otherwise it will damage the components

# **使用注意事项 Precautions for use**

* 使用过程中一定要遵循设计参数及使用条件，不得违背本规格书参数使用，否则容易损坏保护板，进而损坏电池组。
* During use, the design parameters and use conditions must be followed, and the parameters of this specification must not be used, otherwise the protection board will be easily damaged and the battery pack will be damaged.
* 使用过程中要防静电，在测试，安装，接触该保护板时，要有相应的放静电措施。
* Prevent static electricity during use. When testing, installing, and touching the protective board, take corresponding measures to discharge static electricity.
* 充电口最高可承受规定的直流电压，高于此电压的充电器，不能保证保护板不被损坏,请按此规格内使用充电器。
* The charging port can withstand up to the specified DC voltage. For chargers higher than this voltage, there is no guarantee that the protection board will not be damaged. Please use the charger within this specification.
* 使用过程中如出现异常情况，请立即停止使用，送回原厂或请专业维修人员进行维修。
* If there is any abnormality during use, please stop using it immediately and return it to the original factory or ask professional maintenance personnel for repair.
* 禁止将两个及两个以上的保护板串联及并联使用
* It is forbidden to use two or more protection boards in series and parallel
* 本保护板已经做了大量的可靠性试验，可靠性远远高于市面上的一般保护板，电芯的工艺 也要同时保证.
* This protection board has done a lot of reliability tests, and the reliability is much higher than that of the general protection boards on the market, and the process of the battery cell must be guaranteed at the same time.

**BOM LIST**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 序号  No., | 元器件编号  Component number | 规格/描述  Specification Description | 用量  Use | 备注  Remark |
| 1 | MOS 管  MOSFET | 充电：D3\*9PCS ; 放电: D3\*9PCS  Charging: D3\*9PCS; Discharge: D3\*9PCS |  |  |
| 2 | CON3 温控  CON3 temperature control | 85ºC（常开）  85ºC (normally open) |  |  |

* **郑重说明：**

为了不断提升产品可靠性，稳定性或者提高生产效率，本产品有可能会自动升级版本而无需重新送样（升级后保证可靠性及稳定性优于前版本，且电性参数不会改变），所以如果贵司使用我司产品有申请安规等方面的认证，敬请告知，并在承认书的封面“客户备注”栏处说明。

* Solemnly explain:

In order to continuously improve product reliability, stability or production efficiency, this product may automatically upgrade the version without re-sending samples (after the upgrade, the reliability and stability are better than the previous version, and the electrical parameters will not change), Therefore, if your company uses our products and applies for certification in respect of safety regulations, please let us know and explain in the "Customer Remarks" column on the cover of the acknowledgement.

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