GODIYMODULES BMS-6S-13S-25A-4.2V

GODIYMODULES Multi-Cell Li-ion Battery Management System (BMS) Module Instruction Manual

Model: BMS-6S-13S-25A-4.2V | Brand: GODIYMODULES

1. Introduction

This instruction manual provides essential information for the safe and effective use of the GODIYMODULES Multi-Cell Lithium-ion Battery Management System (BMS) Module. This module is designed to protect lithium-ion battery packs ranging from 6 series (6S) to 13 series (13S) configurations, ensuring their longevity and safe operation by managing charging, discharging, and various protection functions.
The BMS module integrates features such as overcharge, over-discharge, overcurrent, and temperature protection, which are crucial for the stability and safety of high-energy density lithium-ion battery packs.

2. Safety Information

WARNING: Working with lithium-ion batteries and high-current circuits can be dangerous. Incorrect wiring or handling can lead to fire, explosion, or severe injury. Always exercise extreme caution.

- Ensure all connections are correct and secure before applying power.
- Verify battery cell voltages and polarities before connecting to the BMS.
- Do not short-circuit the battery pack or the BMS terminals.
- Use appropriate personal protective equipment (PPE) such as safety glasses and insulated tools.
- If you are unsure about any step, seek assistance from a qualified professional.
- Keep the BMS module away from moisture and extreme temperatures.

3. Product Overview

The GODIYMODULES BMS module is a compact circuit board designed for robust battery protection. It features multiple MOSFETs for power handling and a dedicated IC for cell voltage monitoring. The board supports a wide range of series configurations, making it versatile for various battery projects.

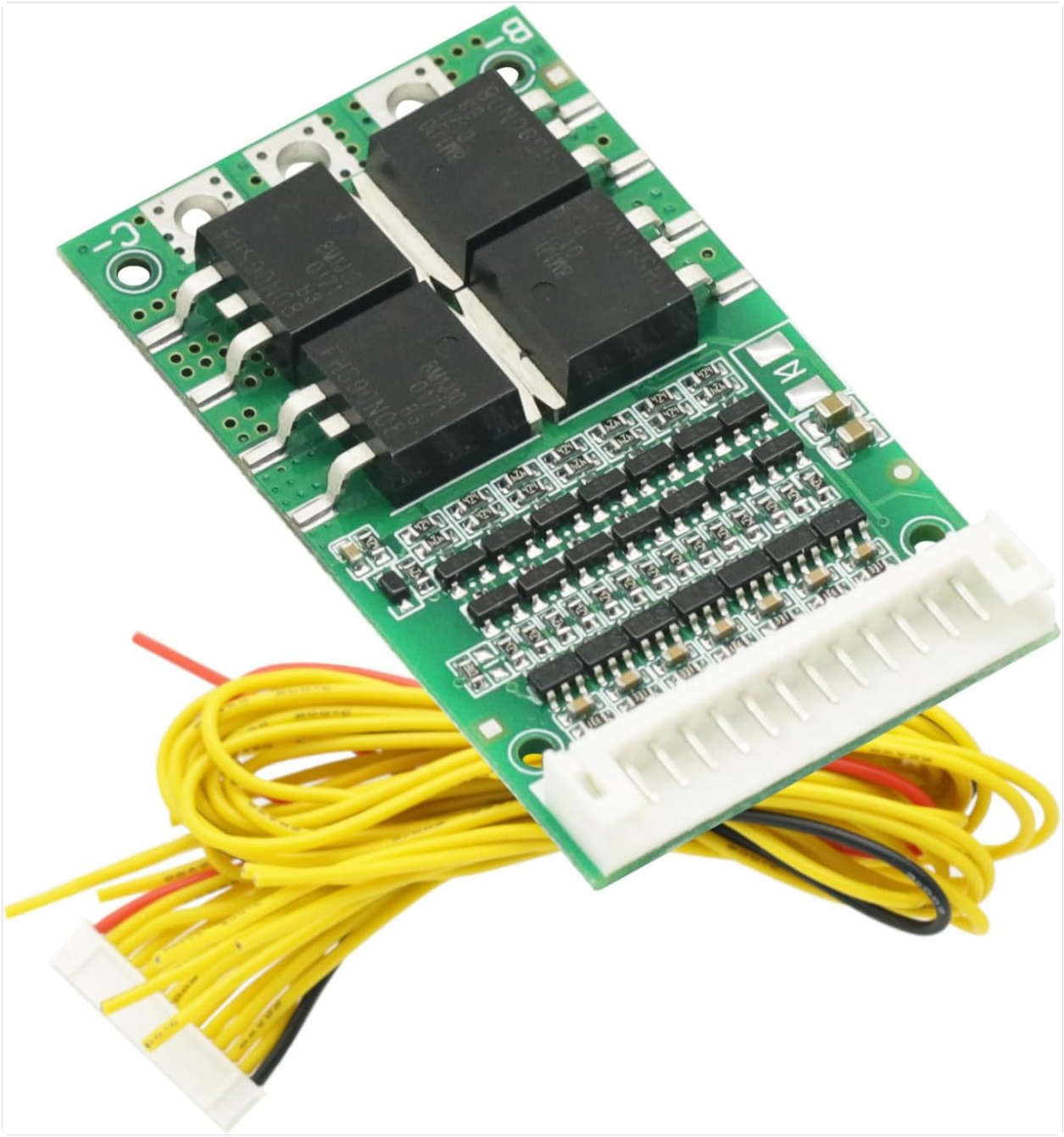

Figure 3.1: Top view of the GODIYMODULES BMS module with its included wiring harness.

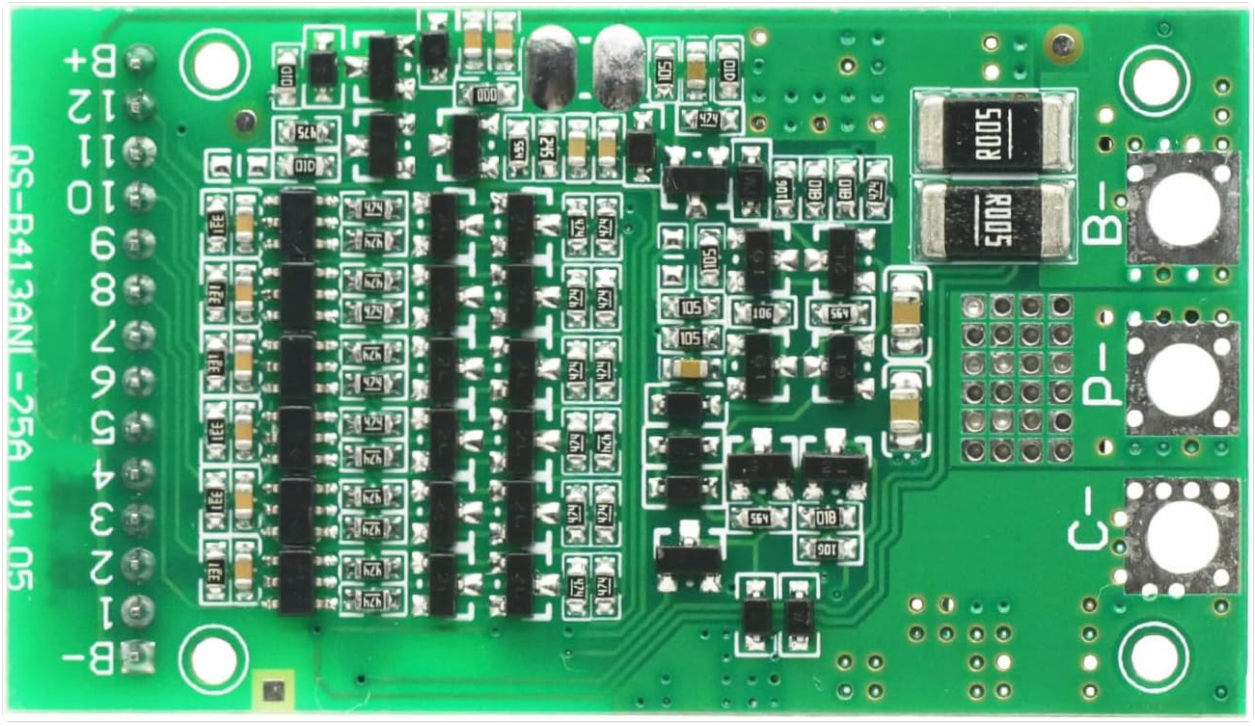

Figure 3.2: Close-up view of the BMS circuit board, showing components and connection points.

Key Features:

- Supports 6S to 13S Li-ion battery configurations.
- Overcharge protection with a detection voltage of approximately 3.75V per cell.
- Over-discharge protection with a detection voltage of approximately 2.1V per cell.
- Overcurrent protection for both discharge (up to 66A peak) and charge (18A continuous).
- Temperature protection with a control interface.
- Low quiescent current (25µA).

4. Specifications

Below are the detailed technical specifications for the GODIYMODULES BMS module. Please note that typical values are provided, and slight variations may occur.

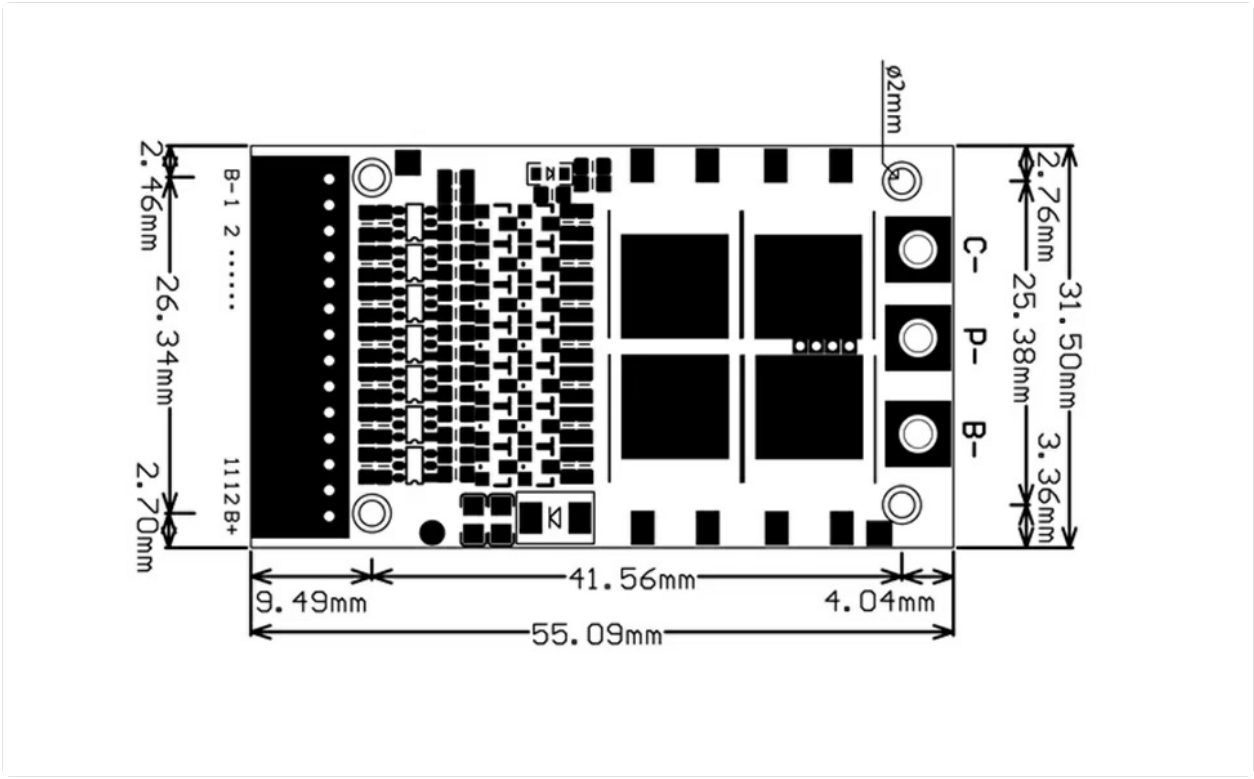

Figure 4.1: Detailed specifications for protection items, including voltage and current thresholds.

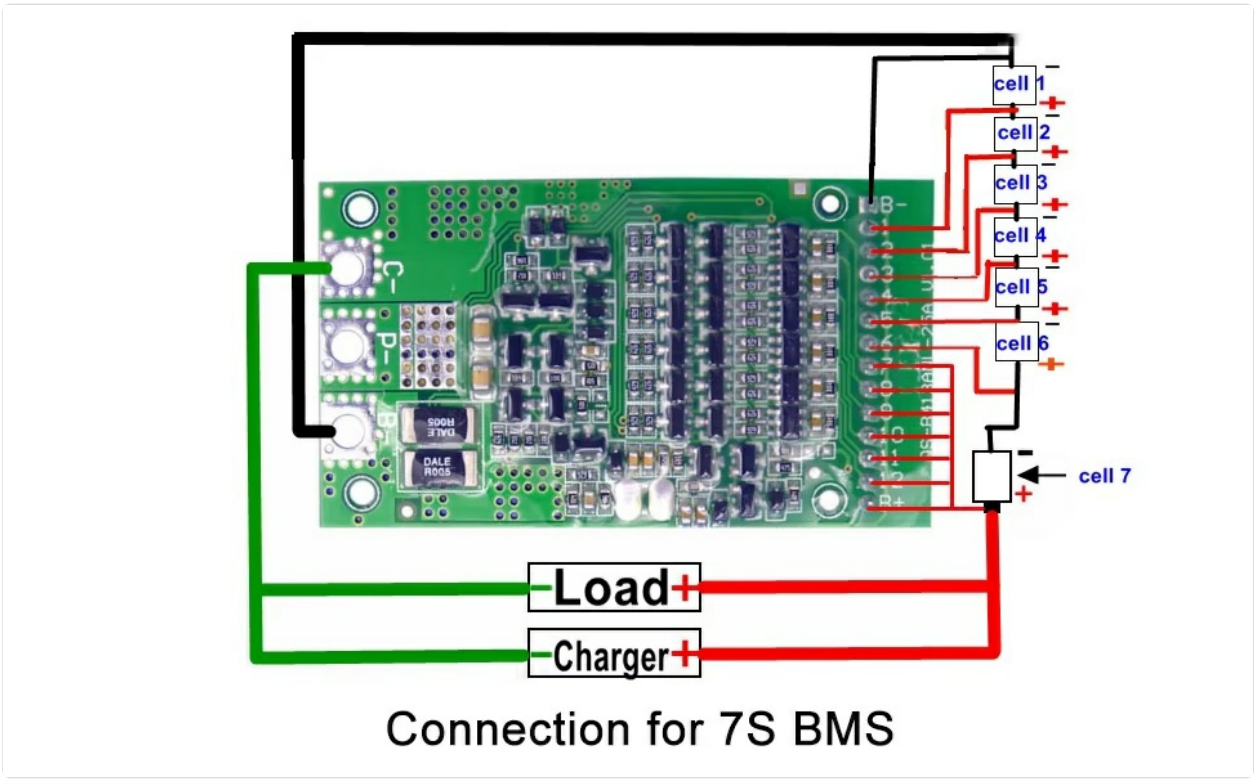

Figure 4.2: Detailed specifications for continuous discharge/charge current and quiescent current.

Table 4.1: GODIYMODULES BMS Module Specifications

Parameter	Min	Typical	Max	Unit
Over-charge Detection Voltage	3.725	3.75	3.775	V
Over-charge Recovery Voltage	3.55	3.6	3.65	V
Over-charge Protection Delay Time	700	1000	1300	ms

Parameter	Min	Typical	Max	Unit
Over-discharge Detection Voltage	2.05	2.1	2.15	V
Over-discharge Recovery Voltage	2.25	2.3	2.35	V
Over-discharge Protection Delay Time	105	140	175	ms
Over-discharge Protection Current	54	60	66	A
Common-port Discharge Current (Continuous)		18		A
Over-discharge Current Protection Delay Time	18	24	30	ms
Over-charge Current Protection	32	40	48	A
Charging Current (Continuous)		18		A
Over-charge Current Protection Delay Time	12	16	20	ms
Quiescent Current		25		µA
Temperature Protection	Yes, with Temperature Control Interface			
Overcurrent Protection	Cut off the load			
Short-circuit Protection	Disconnect Load to Release			
Balancing Function	None			
Body Dimensions	55.13 x 31.57 x 6 mm (approx.)			
Output Voltage (Nominal per cell)	4.2 Volts (Charging termination voltage)			
Continuous Discharge Current	18 Amps			
Continuous Charging Current	18 Amps			
Connector Type	XT60 (for main power, general recommendation)			

Note on Voltage Discrepancy: The product title mentions "4.2V Lithium Li-ion Battery". This typically refers to the nominal maximum charging voltage per cell for standard Li-ion batteries. The "Over-charge Detection Voltage" of 3.75V (typical) refers to the voltage threshold at which the BMS initiates overcharge protection for an individual cell. The BMS is designed for 4.2V cells.

Note on Current Rating: The product title mentions "25A", while specifications list "Common-port Discharge Current (Continuous): 18A" and "Over-discharge Protection Current: 60A (peak)". The continuous discharge and charge current is 18A. The 25A likely refers to a maximum instantaneous or burst current, or a different model variant. For sustained operation, adhere to the 18A continuous rating.

Protection Item	Min	Typ	Max	Unit
Over - charge Voltage	4.23	4.25	4.27	V
Over - charge Recovery Voltage	4.14	4.19	4.24	V
Over - charge Voltage Protection Delay Time	700	1000	1300	mS
Over - discharge Voltage	2.72	2.8	2.88	V
Over - discharge Recovery Voltage	2.9	3	3.1	V
Over - discharge Voltage Protection Delay Time	105	140	175	mS
Over - discharge Protection Current	54	60	66	A

Figure 4.3: Dimensional drawing of the BMS module, showing key measurements in millimeters.

5. Setup and Installation

Careful wiring is critical for the correct and safe operation of the BMS. Follow these instructions precisely.

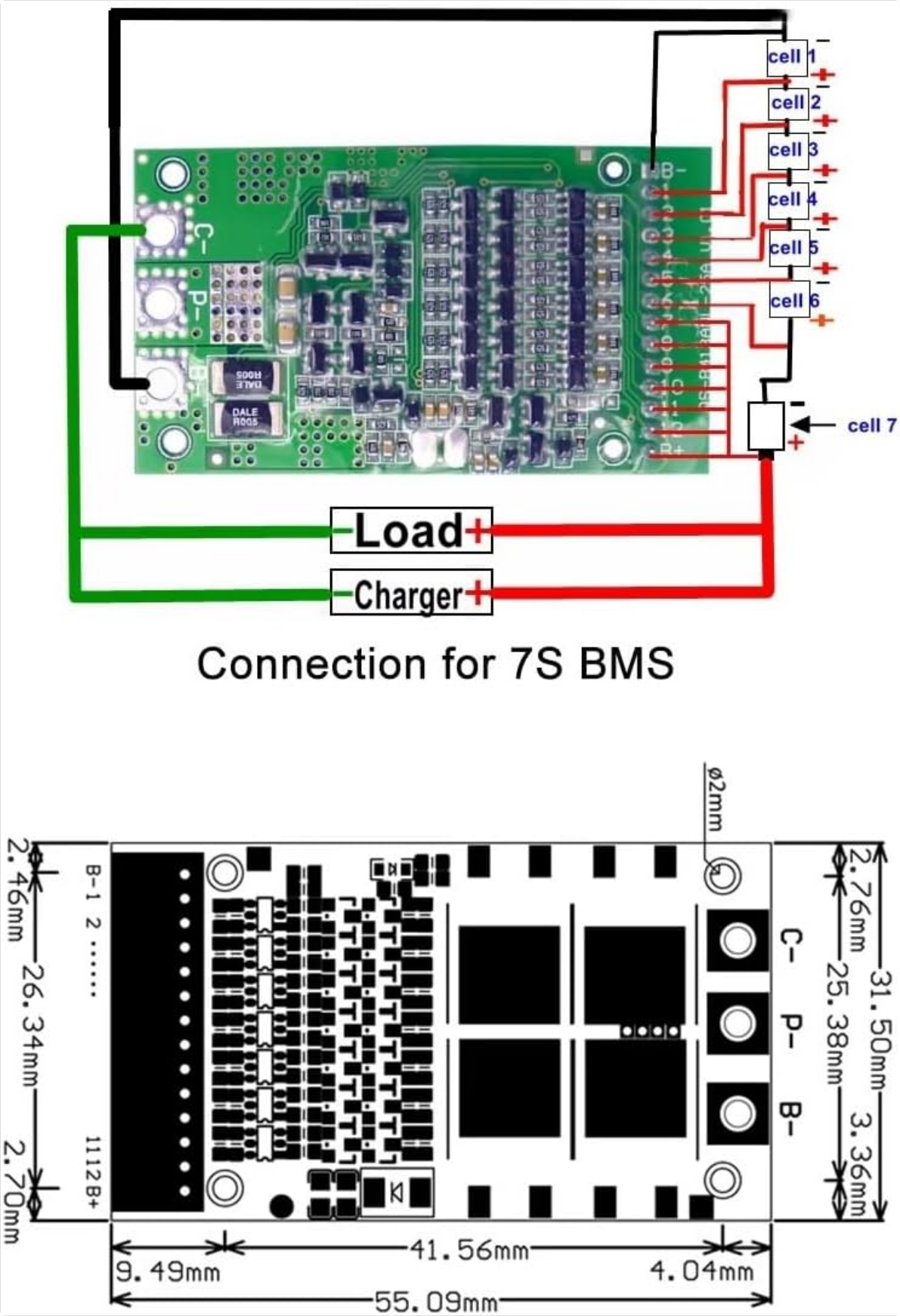

Figure 5.1: Example wiring diagram for a 7S battery pack. The principle applies to 6S-13S configurations.

Wiring Steps:

1. **Prepare Battery Pack:** Ensure all individual cells in your battery pack are balanced (have similar voltages) before connecting to the BMS. This is crucial for optimal performance and safety, especially since this BMS does not have an active balancing function.
2. **Connect Main Negative (B-):** Connect the thickest negative wire from the BMS (labeled B-) to the main

negative terminal of your entire battery pack (the negative terminal of the first cell).

3. **Connect Balance Leads:**
    - The BMS comes with a multi-pin connector and thin wires (balance leads). These wires must be connected to the positive terminals of each individual cell, starting from the first cell's positive terminal (which is also the negative of the second cell).
    - Connect the first balance lead (often labeled B1 or the lowest numbered wire) to the positive terminal of the first cell (Cell 1+).
    - Connect the second balance lead (B2) to the positive terminal of the second cell (Cell 2+), and so on.
    - The highest numbered balance lead (e.g., B13 for a 13S pack) connects to the main positive terminal of the entire battery pack (Cell 13+).
    - **Important:** Connect the balance leads in ascending order of cell voltage. Incorrect order can damage the BMS.
    - **For fewer than 13S:** If your battery pack has fewer than 13 cells (e.g., 7S), connect the unused higher-numbered balance leads (e.g., B8 through B13 for a 7S pack) to the same point as the highest active balance lead (B7+ in a 7S example). This effectively bridges them to the pack's positive terminal.
4. **Connect Load Negative (P-):** Connect the negative terminal of your load (e.g., motor controller, inverter) to the P- terminal on the BMS.
5. **Connect Charger Negative (C-):** Connect the negative terminal of your battery charger to the C- terminal on the BMS.
6. **Main Positive Connection:** The main positive terminal of the battery pack (Cell N+, where N is your series count) is typically connected directly to the positive terminals of both the load and the charger, bypassing the BMS for the positive path. This is a common-port BMS design.

Always double-check all connections with a multimeter before applying power. Verify that the voltage across each balance lead corresponds to the correct cell voltage.

6. Operating Principles

The GODIYMODULES BMS continuously monitors the voltage of each individual cell within the battery pack, as well as the overall current flowing in and out of the pack. When any monitored parameter exceeds or falls below its predefined safe threshold, the BMS will activate its protection mechanisms.

- **Overcharge Protection:** If any cell voltage rises above the overcharge detection voltage (e.g., 3.75V), the BMS will cut off the charging current to prevent cell damage. Charging will resume once the cell voltage drops to the recovery voltage.
- **Over-discharge Protection:** If any cell voltage drops below the over-discharge detection voltage (e.g., 2.1V), the BMS will cut off the discharge current to prevent irreversible cell damage. Discharge will resume once the cell voltage rises to the recovery voltage (typically by applying a charge).
- **Overcurrent Protection:** If the discharge or charge current exceeds the specified limits (e.g., 18A continuous, 60A peak discharge protection), the BMS will temporarily cut off the current to protect the battery and the BMS itself. This protection typically recovers automatically once the overload is removed.
- **Temperature Protection:** The BMS monitors its own temperature or an external thermistor (if connected). If the temperature exceeds safe operating limits, it will cut off charge/discharge to prevent thermal runaway.

7. Troubleshooting

If you encounter issues with your BMS module, consider the following troubleshooting steps:

- **No Output Power / BMS Not Functioning:**
  - Verify all wiring connections, especially the main B-, P-, C- terminals, and all balance leads. A single incorrect balance lead connection can prevent the BMS from operating.
  - Check the voltage of each individual cell. If any cell is significantly overcharged or over-discharged, the BMS may be in a protected state.
  - Ensure the main battery pack voltage is within the operational range for your series configuration.
- **BMS Cuts Off Power Prematurely:**
  - **Overcurrent:** The load might be drawing more current than the BMS's continuous or peak rating. Reduce the load or ensure your application's current draw is within limits.
  - **Over-discharge:** One or more cells might be reaching their low voltage threshold faster than others, indicating an unbalanced pack or a faulty cell. Check individual cell voltages.
  - **Temperature:** The BMS or battery pack might be overheating. Ensure adequate ventilation.
- **Battery Not Charging:**
  - Verify the charger is connected correctly to C- and the main positive.
  - Check if any cells are in an overcharged state, triggering overcharge protection.
  - Ensure the charger's voltage and current output are compatible with your battery pack and BMS.

If issues persist after troubleshooting, contact the manufacturer for further assistance.

8. Maintenance

The GODIYMODULES BMS module is designed for reliable operation with minimal maintenance. However, following these guidelines can help ensure its longevity:

- **Keep Clean and Dry:** Protect the BMS from dust, dirt, and moisture. Do not expose it to water or corrosive substances.
- **Inspect Connections:** Periodically check all wiring connections for tightness and signs of corrosion or damage. Loose connections can lead to poor performance or safety hazards.
- **Ventilation:** Ensure the BMS and battery pack have adequate ventilation, especially during high-current operation, to prevent overheating.
- **Avoid Physical Damage:** Handle the board carefully to prevent physical damage to components or solder joints.

9. Warranty and Support

For warranty information, technical support, or inquiries regarding the GODIYMODULES BMS module, please refer to the product's purchase platform or contact GODIYMODULES directly through their official channels. Please have your product model and purchase details ready when contacting support.

Related Documents - BMS-6S-13S-25A-4.2V

	JIKONG JK-B2A24S-30P Lithium Battery Active Balancing Protection Board Manual Comprehensive maintenance and user manual for the JIKONG JK-B2A24S-30P Lithium Battery Active Balancing Protection Board. Details product overview, functional characteristics, selection guides, detailed function descriptions, main parameters, interface definitions, installation methods, and APP operation instructions. Supports various lithium battery chemistries and configurations.
	JK-BD4A24S-4P Lithium Battery Active Balancing Protection Board User Manual Detailed user and maintenance manual for the JK-BD4A24S-4P Lithium Battery Active Balancing Protection Board by Chengdu Jikong Technology Co., LTD. Covers product overview, features, selection guide, functions, parameters, interface definition, installation, and APP operation.
	JK-BD6A8S-10P Lithium Battery Active Balancing Protection Board - Jikong Technology Detailed product specification and maintenance manual for the JK-BD6A8S-10P Lithium Battery Active Balancing Protection Board by Chengdu Jikong Technology Co., LTD. Features include active equalization, overcharge/discharge protection, temperature monitoring, and APP control.
	JKBMS Smart BMS with Active-Balancer (JK-B2A25S-RP) - Specification and Operation Manual This document provides comprehensive specifications and operational guidance for the JKBMS Smart BMS with Active-Balancer, model JK-B2A25S-RP. It details product features, technical parameters, connector definitions, installation procedures, app operation, safety precautions, transportation and storage guidelines, default parameter settings, and troubleshooting FAQs for various lithium battery types.
	JK-QB2A8S-20P Lithium Battery Active Balancing Protection Board - User Manual Detailed user and maintenance manual for the JIKONG JK-QB2A8S-20P Lithium Battery Active Balancing Protection Board. Covers product overview, features, specifications, interface definitions, installation, and APP operation.
	JK-B1A8S-10P Lithium Battery Active Balancing Protection Board User Manual Comprehensive user manual for the Chengdu Jikong Technology JK-B1A8S-10P Lithium Battery Active Balancing Protection Board, detailing its specifications, advanced features like active balancing and GPS/Bluetooth, protection functions, and application in various battery systems.