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TenNuoDa HX-3S-01

TenNuoDa HX-3S-01 Lipo Battery Protection Board User Manual

1. Introduction

The TenNuoDa HX-3S-01 is a Lipo Battery Protection Board (BMS) designed for 3-series lithium battery packs. This module provides essential protection functions to ensure the safety and longevity of your lithium batteries during charging and discharging cycles. It is suitable for various applications, including vacuum massager battery packs, LED lamp standby power supplies, and other 12V electronic products.

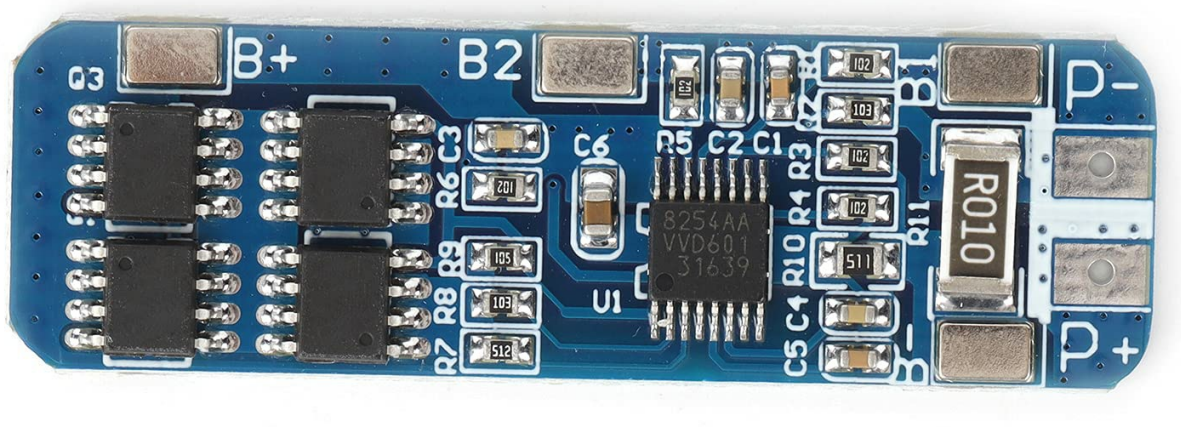


Figure 1: The HX-3S-01 Lipo Battery Protection Board against a circuit background, illustrating its electronic nature.

2. Features

- **Seiko Manufacturing:** Constructed from high-quality electronic components for durability and stable performance.
- **Efficient Design:** Lightweight, portable, and compact, suitable for applications requiring high integration and low cost.
- **Stable Balance Function:** Ensures each battery cell is fully charged simultaneously, promoting battery health.
- **Comprehensive Protection:** Offers protection against overcharge, over-discharge, over-current, over-voltage, short circuit, and temperature fluctuations.
- **Separate Charging/Discharging:** Features separate connectors for charging and discharging, with a discharging current of 8A.

3. Specifications

Specification	Value
Model	HX-3S-01
Battery Type	3-Series Lipo Battery
Discharging Current	8A
Protection Functions	Overcharge, Over-discharge, Over-current, Over-voltage, Short Circuit, Temperature
Balance Function	Yes
Item Weight	0.352 ounces (0.01 Kilograms)

4. Setup Instructions

Proper connection of the HX-3S-01 protection board is crucial for its correct operation and the safety of your battery pack. Always ensure power is disconnected before making any connections. Refer to the wiring diagram and connection points carefully.

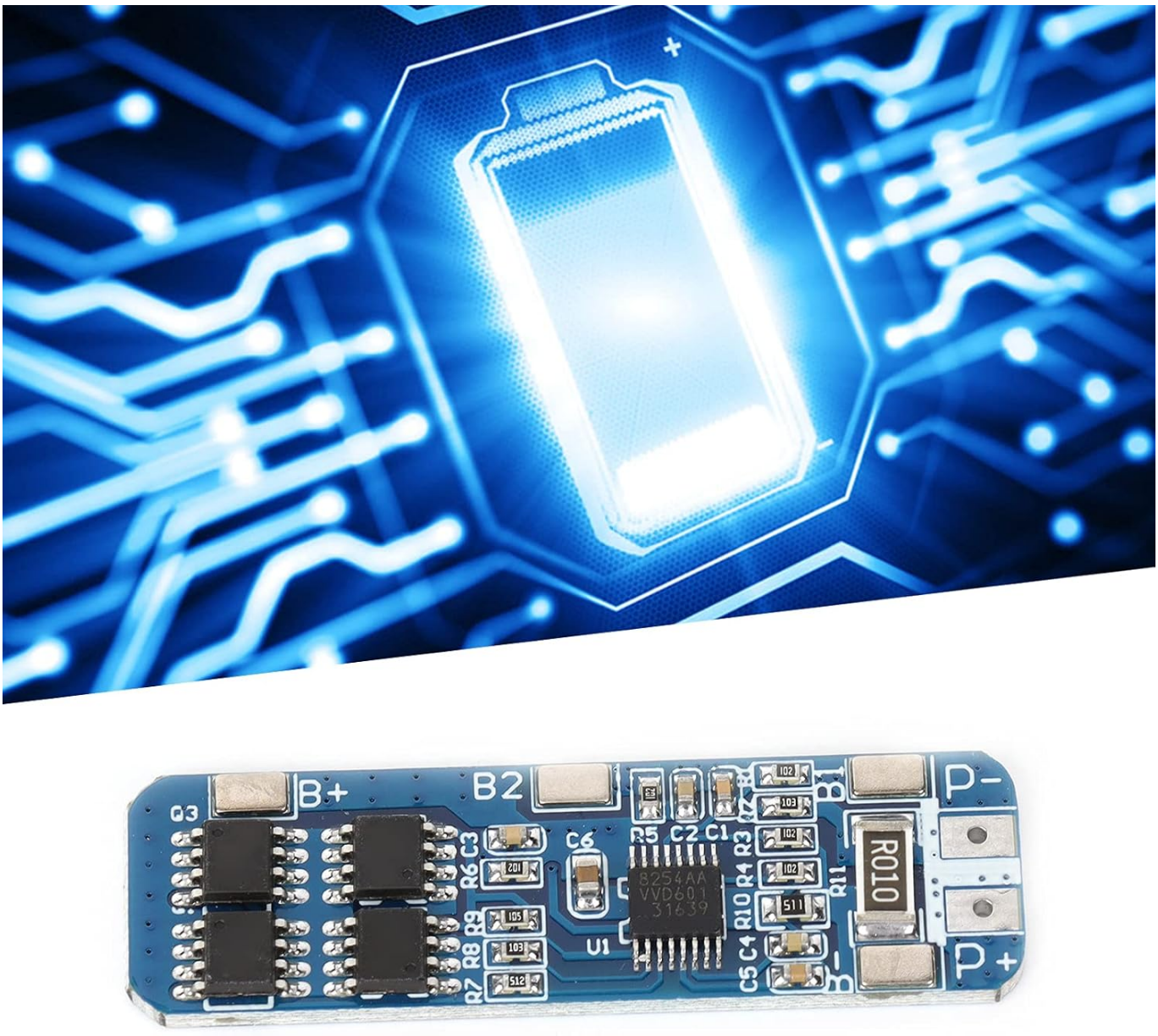


Figure 2: Top-down view of the HX-3S-01 board, highlighting the various connection pads for battery cells and load/charger.

Wiring Connections:

- **B+:** Connect to the positive terminal of the entire 3-series battery pack.
- **B-:** Connect to the negative terminal of the entire 3-series battery pack.
- **B1:** Connect to the positive terminal of the first cell and the negative terminal of the second cell.
- **B2:** Connect to the positive terminal of the second cell and the negative terminal of the third cell.
- **P+:** Connect to the positive terminal of the charger and the positive terminal of the load.
- **P-:** Connect to the negative terminal of the charger and the negative terminal of the load.

Ensure all connections are secure and properly insulated to prevent short circuits. Double-check polarity before applying power.

5. Operation

Once correctly wired, the HX-3S-01 board operates automatically to manage your 3-series Lipo battery pack. It continuously monitors the voltage of each cell and the overall current flow to provide protection.

- **Charging:** During charging, the board monitors for overcharge conditions and balances the voltage across individual cells to ensure they reach full charge simultaneously and safely.
- **Discharging:** During discharge, it protects against over-discharge, over-current, and short circuits. If any of these conditions are detected, the board will temporarily cut off the power output to protect the battery cells.
- **Temperature Protection:** The board also includes temperature monitoring to prevent damage from overheating.

The protection features are designed to automatically reset once the fault condition is removed (e.g., removing the load after an over-current event, or starting charging after an over-discharge event).

6. Maintenance

The HX-3S-01 Lipo Battery Protection Board requires minimal maintenance. Adhering to these guidelines will help ensure its long-term reliability:

- **Keep Clean and Dry:** Protect the board from dust, dirt, and moisture. Clean gently with a dry, soft brush if necessary.
- **Inspect Connections:** Periodically check all wiring connections for looseness or corrosion. Ensure insulation remains intact.
- **Avoid Physical Damage:** Handle the board with care to prevent bending, dropping, or other physical impacts that could damage components.
- **Operating Environment:** Use the board within its specified temperature and humidity ranges to ensure optimal performance.



Figure 3: Underside view of the HX-3S-01 board, showing the solder pads and manufacturing markings.

7. Troubleshooting

If you encounter issues with your HX-3S-01 protection board, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
No output voltage (P+ / P-)	Over-discharge protection triggered, short circuit, or over-current.	Connect charger to reset protection. Check for short circuits or excessive load.
Battery pack not charging	Overcharge protection triggered, or charger issue.	Verify charger functionality and voltage. Ensure individual cell voltages are not already at maximum.
Uneven cell voltages after charging	Balance function not fully effective or significant cell imbalance.	Allow more time for balance charging. If persistent, check individual cell health.
Board becomes excessively hot	Over-current condition or internal fault.	Reduce load. Disconnect power immediately and inspect for damage.

If the problem persists after attempting these solutions, please contact customer support.

8. Warranty and Support

TenNuoDa is committed to providing quality products and customer satisfaction. We offer round-the-clock customer service to assist with any questions or concerns regarding our products.

For technical assistance, troubleshooting, or any inquiries, please do not hesitate to contact our support team. We are available 24 hours a day, 7 days a week to provide prompt and helpful service.

Please refer to your purchase documentation for specific warranty details and contact information.

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