Usmile mbec6S

Matek Micro BEC 6-30V to 5V/9V Adjustable Step-Down Regulator Instruction Manual

Model: mbec6S

Introduction

This manual provides essential information for the proper installation, operation, and maintenance of your Usmile Matek Micro BEC 6-30V to 5V/9V Adjustable Step-Down Regulator (Model mbec6S). This high-efficiency synchronous step-down regulator is designed to convert a wide input voltage range (6V to 30V) to a stable 5V or 9V output, suitable for various electronic applications, particularly in FPV racing quadcopters.

Safety Information

- Always ensure correct polarity when connecting the BEC to power sources. Incorrect connections can damage the device and connected components.
- Operate within the specified input voltage range (6V to 30V). Exceeding this range may cause permanent damage.
- Avoid short-circuiting the output. While the device is output short-circuit tolerant for brief periods (5 seconds/minute), prolonged short circuits can lead to overheating and damage.
- Ensure proper ventilation during operation, especially when drawing maximum continuous current.
- Soldering should only be performed by individuals with adequate experience to prevent damage to the small components.
- Keep out of reach of children. This product contains small parts.

Product Overview

The Matek Micro BEC is a compact and efficient power regulation module. It features a synchronous step-down design for high efficiency and includes protection mechanisms such as Over Current Protection (OCP) and Thermal Shutdown.

Key Features:

- High Efficiency Synchronous Step-down Regulator
- Wide 6V to 30V Operating Input Range (suitable for 2S-6S LiPo batteries)
- Adjustable Output: 5V or 9V (default is 5V)
- Continuous Load Current: 1.5 Amps (Max. 2.5A for 5 seconds/minute)
- Output Load Regulation: 2%
- Standby Current: <5mA
- OCP Protection and Hiccup
- Thermal Shutdown
- Output Short-circuit Tolerant (5 seconds/minute)

Specifications

Parameter	Value
Input Voltage Range	6V to 30V DC (2S-6S LiPo)
Output Voltage	5V or 9V (Adjustable)
Continuous Load Current	1.5A
Peak Load Current	2.5A (for 5 seconds/minute)
Output Load Regulation	2%
Standby Current	<5mA
Maximum Duty Cycle	95%
Dimensions	10mm x 14mm x 3mm
Weight	1g
Pin Distance	2.54mm

Setup and Installation

Follow these steps for proper installation of the Matek Micro BEC:

1. **Identify Connections:** The BEC has clearly labeled input (6-30V IN) and output (5V/9V OUT) pads, along with Ground (GND) connections.
2. **Select Output Voltage (5V or 9V):**
    - By default, the BEC outputs **5V**.
    - To change the output to **9V**, you must bridge the two small soldering pads labeled "9V" on the board. This requires careful soldering. Ensure the input voltage is higher than 10V when selecting 9V output.
3. **Wire Input Power:** Connect your power source (e.g., LiPo battery voltage from 6V to 30V) to the "6-30V IN" and corresponding "GND" pads. Observe correct polarity.
4. **Wire Output Power:** Connect your device requiring 5V or 9V power to the "5V/9V OUT" and corresponding "GND" pads.

5. **Secure Installation:** Mount the BEC securely in your application, ensuring it is protected from physical damage and short circuits.

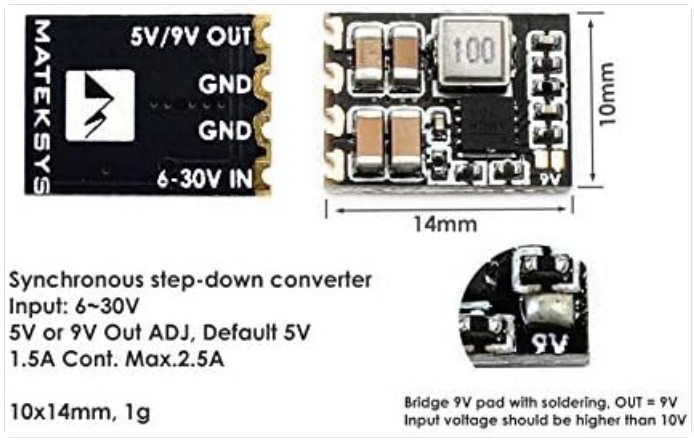

Image 1: Top and bottom view of the Matek Micro BEC, illustrating the input (6-30V IN), output (5V/9V OUT), and ground (GND) pads. The image also highlights the small soldering pads that need to be bridged to switch the output from the default 5V to 9V. Dimensions (10x14mm) are also shown.

Image 2: A pack of three Matek Micro BEC units, displayed alongside a Micro SD card to provide a clear visual reference for their compact size. This image demonstrates the small form factor of the product.

Operating Instructions

Once properly installed and connected, the Matek Micro BEC operates automatically. Apply power within the 6V to 30V input range, and the BEC will provide the selected stable output voltage (5V or 9V) to your connected devices. Monitor the current draw of your connected devices to ensure it does not exceed the continuous load current of 1.5A (or 2.5A peak for short durations).

Maintenance

- **Inspection:** Periodically inspect the BEC and its connections for any signs of damage, loose wires, or corrosion.
- **Cleaning:** If necessary, gently clean the board with a soft, dry brush to remove dust or debris. Do not use liquids or solvents.
- **Storage:** Store the BEC in a dry, cool environment when not in use.

Troubleshooting

Problem	Possible Cause	Solution
No output voltage	Incorrect input polarity; No input power; Short circuit on output; Damaged BEC.	Verify input wiring and polarity. Check input power source. Disconnect output devices to check for short. Replace BEC if damaged.
Output voltage is incorrect (e.g., 5V instead of 9V)	9V bridge pad not soldered; Input voltage too low for 9V output.	Ensure the 9V bridge pad is correctly soldered for 9V output. Verify input voltage is above 10V for 9V output.
BEC gets excessively hot	Overload on output; Insufficient ventilation; Input voltage too high (though within range, higher voltage means more heat for same output power).	Reduce load on the output. Ensure adequate airflow around the BEC. Consider using a lower input voltage if possible, or a BEC with higher current rating.
Intermittent power to connected devices	Loose connections; Output current exceeding limits; Thermal shutdown activation.	Check all solder joints and wire connections. Reduce load. Allow BEC to cool if thermal shutdown is suspected.

Warranty and Support

This product is manufactured by Usmile. For warranty information or technical support, please refer to the retailer where the product was purchased or contact Usmile customer service directly. Please have your product model number (mbec6S) and purchase details available when seeking support.