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Valefod LM2596

Valefod LM2596 DC-DC Buck Converter with LED Display Instruction Manual

Model: LM2596 / VA-0162-BL

INTRODUCTION

This manual provides comprehensive instructions for the safe and effective use of the Valefod LM2596 DC-DC Buck Converter with LED Display. This module is designed to step down a DC input voltage to a lower, adjustable DC output voltage, featuring an integrated LED display for real-time voltage monitoring.

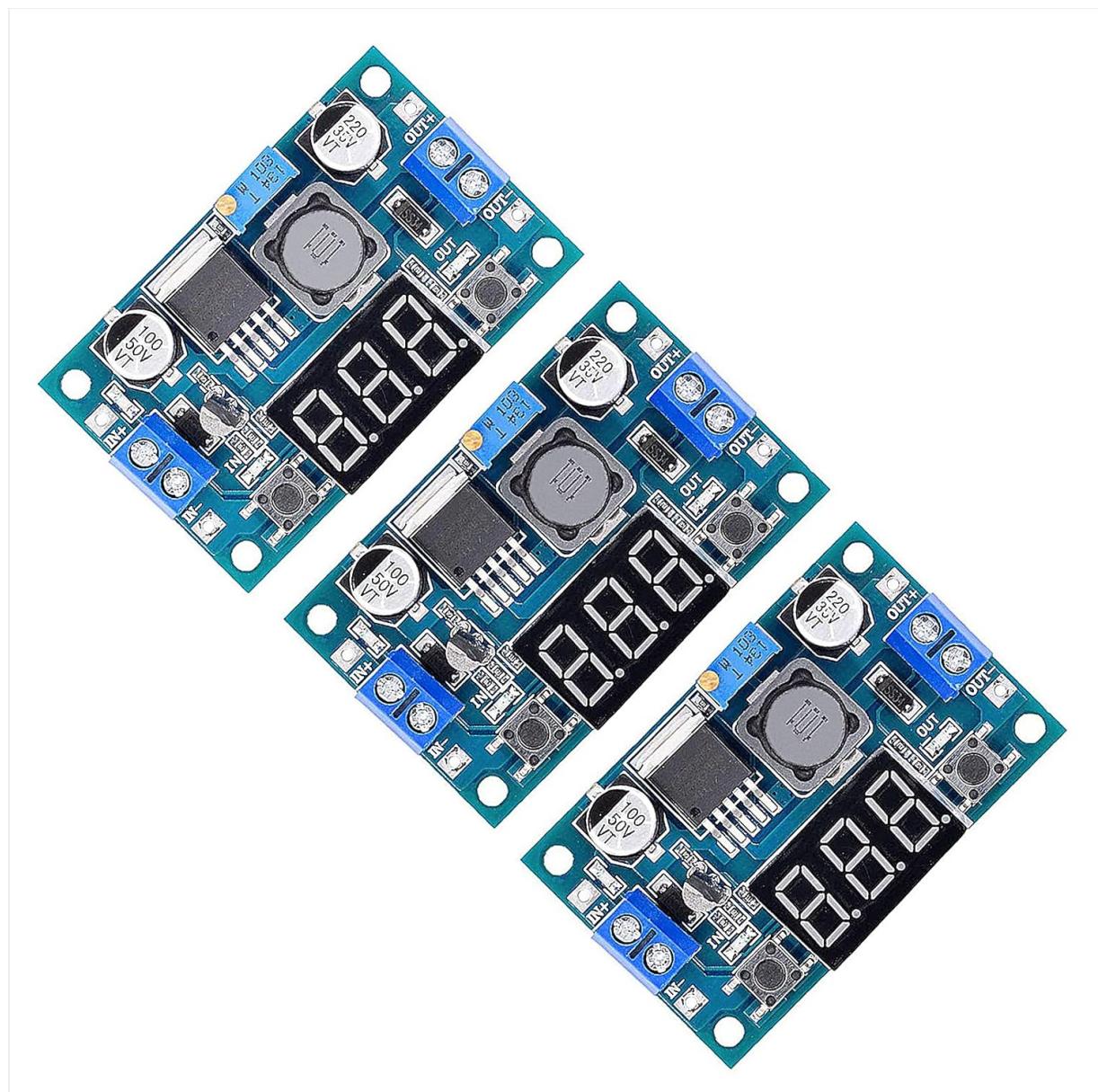


Image 1: Three Valefod LM2596 DC-DC Buck Converter modules.

SAFETY INFORMATION AND IMPORTANT NOTES

- **Input Voltage Requirement:** The input voltage must be at least 1.5V higher than the desired output voltage. This module is a buck (step-down) converter and cannot boost voltage.
- **Polarity:** Ensure correct polarity when connecting input and output wires. Do not reverse the input and output interfaces to prevent damage to the module.
- **Output Current/Power:** Keep the output current under 2A (or 15W). For prolonged operation at higher loads, a heat sink is recommended to prevent overheating.
- **Electrical Safety:** Always disconnect power before making any connections or adjustments. Exercise caution when working with electrical circuits.

PRODUCT FEATURES

- DC-DC step-down module with integrated LED digital voltmeter.
- Thickened circuit boards and advanced solid-state capacitors for stable performance.
- Short circuit and over-temperature protection.

- Adjustable output voltage via a multi-turn potentiometer.
- Display can show either input or output voltage.

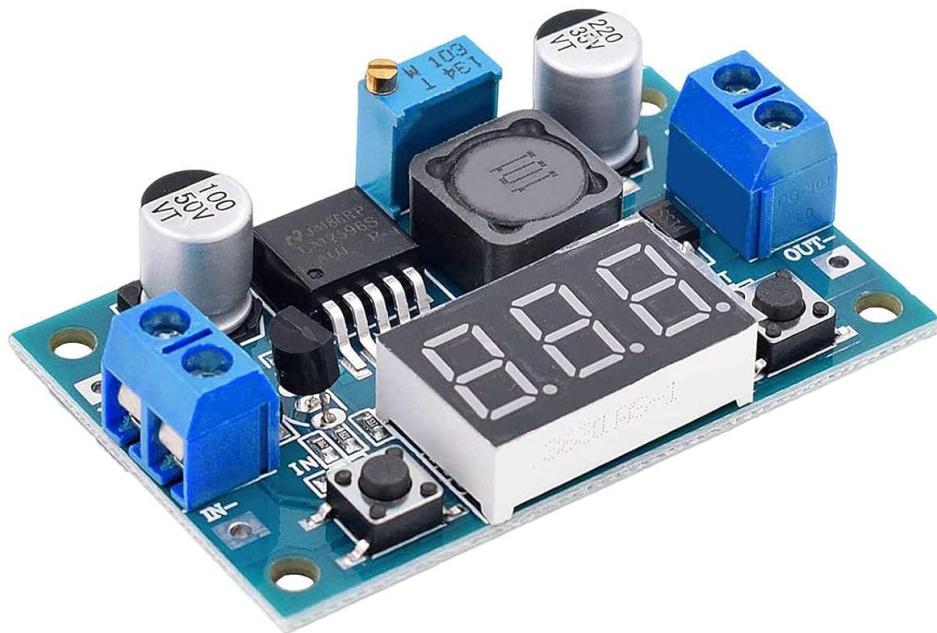


Image 2: Close-up view of a single LM2596 module.

SETUP AND CONNECTIONS

Before connecting the module, ensure all power sources are disconnected.

1. **Identify Terminals:** Locate the "IN+" (Input Positive), "IN-" (Input Negative), "OUT+" (Output Positive), and "OUT-" (Output Negative) screw terminals on the module.
2. **Input Connection:** Connect your DC power source to the "IN+" and "IN-" terminals. Ensure the positive lead of your power source connects to "IN+" and the negative lead to "IN-".
3. **Output Connection:** Connect your load (the device requiring regulated voltage) to the "OUT+" and "OUT-" terminals. Ensure the positive lead of your load connects to "OUT+" and the negative lead to "OUT-".
4. **Initial Voltage Adjustment:** Before applying power to your load, it is recommended to pre-adjust the output voltage. Connect a multimeter to the output terminals and adjust the potentiometer until the desired voltage is displayed.

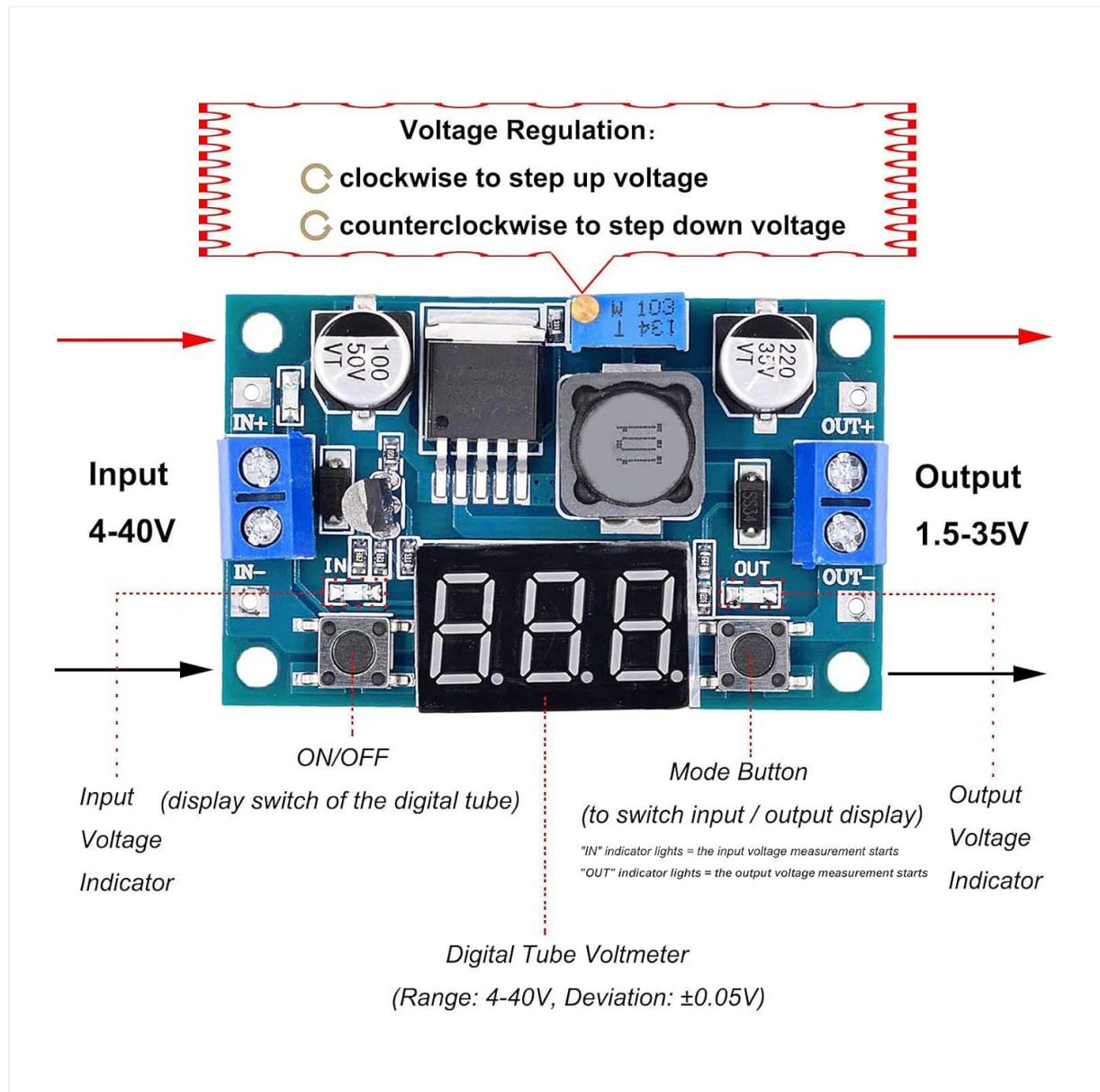


Image 3: Module layout and connection points.

OPERATING INSTRUCTIONS

Voltage Adjustment

The output voltage is adjusted using the blue multi-turn potentiometer located on the module.

- Use a small screwdriver to turn the screw on the potentiometer.
- Turning **clockwise** will generally **increase** the output voltage.
- Turning **counter-clockwise** will generally **decrease** the output voltage.
- Note:** The factory default setting often results in a high output voltage. You may need to turn the potentiometer counter-clockwise approximately 7-15 full rotations before the voltage begins to decrease. Each full rotation typically adjusts the voltage by about 1V.

Digital Voltmeter Operation

The integrated LED display provides real-time voltage readings.

- ON/OFF Button (Left Button):**
 - Short Press:** Toggles the digital voltmeter display ON or OFF.

- **Long Press (>1s, <4s):** Shuts down the digital voltmeter display.
- **Long Press (>4s):** Enters voltage measurement self-calibration mode (see Calibration section).
- **Mode Button (Right Button):**
 - **Short Press:** Switches the display between input voltage ("IN" indicator light) and output voltage ("OUT" indicator light).
 - **Long Press (>2s):** Used during calibration to switch between input and output calibration, and to save calibrated values.

VOLTMETER CALIBRATION (OPTIONAL)

This procedure is for users requiring highly accurate voltage readings from the integrated voltmeter. The factory setting is 0.0V deviation.

1. **Enter Calibration Mode:** With the module powered on, long press the left "ON/OFF" button for more than 4 seconds. The "IN" indicator light will illuminate, signifying input voltage measurement calibration has started. The display will show a calibration value (e.g., "0.0").
2. **Calibrate Input Voltage:** Connect a precise external voltmeter to the input terminals. Compare the reading on the module's display with the external voltmeter.
 - Tap the left button to decrease the displayed value.
 - Tap the right button to increase the displayed value.
 - Each tap adjusts by a small unit (less than 0.1V). You may need to tap 1-5 times to see a 0.1V change. Adjust until the module's display matches your external voltmeter.
3. **Switch to Output Calibration:** After calibrating the input voltage, long press the right "Mode" button for more than 2 seconds. The "OUT" indicator light will illuminate, signifying output voltage measurement calibration has started.
4. **Calibrate Output Voltage:** Connect a precise external voltmeter to the output terminals. Compare the reading on the module's display with the external voltmeter.
 - Tap the left button to decrease the displayed value.
 - Tap the right button to increase the displayed value.
 - Adjust until the module's display matches your external voltmeter.
5. **Save Calibration:** After calibrating both input and output, long press the right "Mode" button for more than 2 seconds. The adjusted values will be saved (retained even after power loss), and the module will return to normal voltage display mode.

SPECIFICATIONS

| Feature | Detail |
|----------------|---------------------------------|
| Model | LM2596 / Digital Tube Voltmeter |
| Input Voltage | DC 4V - 40V |
| Output Voltage | DC 1.5V - 35V (adjustable) |
| Output Current | 3A (maximum) |

| Feature | Detail |
|------------------------|--------------------|
| Conversion Efficiency | 92% (maximum) |
| Switching Frequency | 150KHz |
| Operating Temperature | -45°C to +85°C |
| Dimensions (L x W x H) | 57mm x 36mm x 13mm |
| Weight | 21g per module |

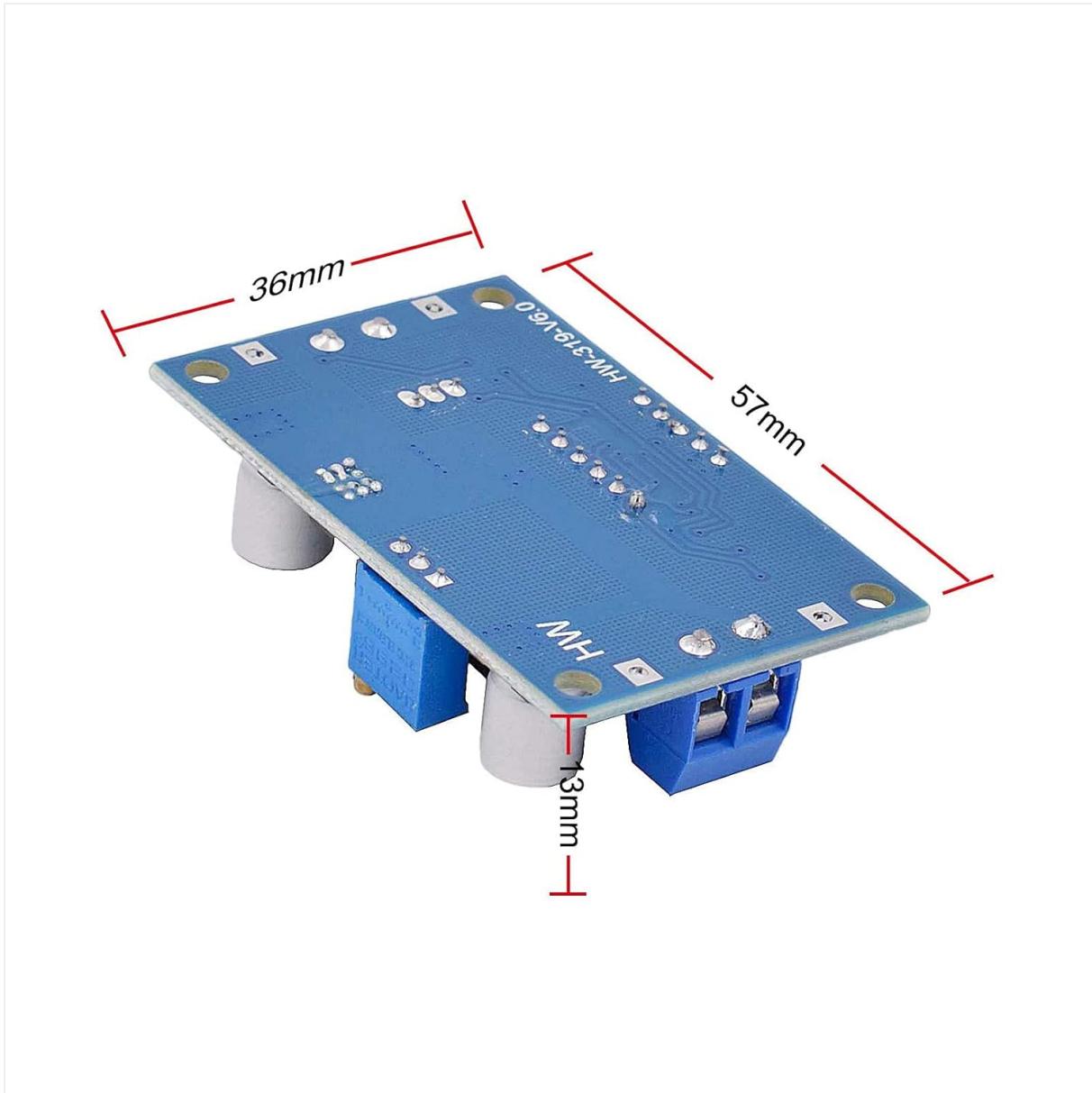


Image 4: Module dimensions.

TROUBLESHOOTING

- **No Output Voltage / Display Off:**

- Check input power supply connections and ensure it is within the 4V-40V range.
- Verify input polarity.
- Ensure the left "ON/OFF" button has been short-pressed to activate the display.

- **Output Voltage Not Adjusting:**

- Confirm input voltage is at least 1.5V higher than the desired output.
- Turn the potentiometer counter-clockwise multiple rotations (7-15) as the default setting might be at maximum voltage.
- Ensure the potentiometer is not damaged.

- **Module Overheating:**

- Reduce the output current or power draw.
- Ensure adequate ventilation around the module.
- Consider adding a heat sink if operating continuously near the maximum current/power limits (2A or 15W).

- **Inaccurate Voltmeter Reading:**

- Perform the voltmeter calibration procedure detailed in this manual.
- Ensure connections to the external multimeter are secure and accurate during calibration.

MAINTENANCE

The Valefod LM2596 module requires minimal maintenance.

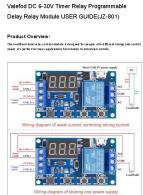
- Keep the module clean and free from dust and debris.
- Avoid exposing the module to excessive moisture or extreme temperatures outside its operating range.
- Periodically check connections for tightness and ensure no wires are frayed or damaged.

WARRANTY AND SUPPORT

For warranty information or technical support, please refer to the product's purchase platform or contact Valefod customer service directly. Please have your model number (LM2596 / VA-0162-BL) and purchase details available when contacting support.

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Related Documents - LM2596

| | |
|---|---|
|  | <p>Valefod DC 6-30V Timer Relay Module JZ-801 User Guide</p> <p>Comprehensive user guide for the Valefod DC 6-30V Timer Relay Module JZ-801. Covers product overview, specifications, operation modes (P1-P4), parameter setting, interface descriptions, and troubleshooting FAQs.</p> |
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|  | <p>DROK LM2596 DC-DC Buck Converter: Specifications and Calibration Guide</p> <p>Comprehensive details and step-by-step instructions for the DROK LM2596 DC-DC Buck Converter, covering product parameters, voltage calibration, and operational features.</p> |
|  | <p>LM2596 SIMPLE SWITCHER 3A Step-Down Voltage Regulator Datasheet National Semiconductor</p> <p>Datasheet for the National Semiconductor LM2596 SIMPLE SWITCHER Power Converter. This 150 kHz, 3A step-down (buck) voltage regulator offers high efficiency, thermal shutdown, and current limit protection. Includes electrical characteristics, performance data, application information, and design procedures for fixed and adjustable output versions.</p> |
|  | <p>Converting a 3D Printer Into an Automatic Spray Coater</p> <p>A step-by-step guide on how to convert a standard 3D printer into an automated spray coater using an airbrush, servomotor, and Arduino control. Learn to build a precise spray system for applications like conductive ink development.</p> |
|  | <p>AlphaBot Raspberry Pi Robot Building Kit for STEM Education</p> <p>Discover the AlphaBot Raspberry Pi robot building kit, a versatile platform for STEM education and robotics. This kit enables line tracking, obstacle avoidance, speed measuring, IR control, and video monitoring, supporting both Raspberry Pi and Arduino for advanced robotic development.</p> |
|  | <p>DIY Dash Camera Power Supply with Ultra-Low 50uA Power-Off Consumption</p> <p>A comprehensive guide to building a custom power supply for dash cameras that significantly reduces standby power consumption to just 50uA, saving car batteries during long parking periods. This project details circuit design, component selection, assembly, programming, and installation.</p> |