

DORHEA LM2596 Buck Converter

DORHEA LM2596S DC-DC Buck Converter with LED Display Voltmeter Instruction Manual

Model: LM2596 Buck Converter | Brand: DORHEA

INTRODUCTION

This manual provides detailed instructions for the DORHEA LM2596S DC-DC Buck Converter with LED Display Voltmeter. This module is designed to convert a higher DC input voltage to a lower, adjustable DC output voltage, featuring an integrated voltmeter for real-time voltage monitoring.

SAFETY INFORMATION

- Ensure proper polarity when connecting input and output. Reversing polarity can damage the module.
- The input voltage must always be higher than the desired output voltage. This is a buck (step-down) converter.
- Do not exceed the maximum input voltage of 40V or the maximum output current of 3A (2A stable).
- For continuous operation above 2A or 15W, a heat sink is required to prevent overheating and potential damage.
- Handle the module with care to avoid electrostatic discharge.
- Keep out of reach of children.

PRODUCT OVERVIEW

The LM2596S DC-DC Buck Converter is a highly efficient step-down voltage regulator module. It features a digital

LED display voltmeter for monitoring input or output voltage, and a potentiometer for continuous output voltage adjustment.

Key Features:

- Stable output with up to 96% conversion efficiency.
- Adjustable output voltage range: 1.25V to 37V.
- Maximum output current: 3A (2A normal and stable).
- Integrated digital LED voltmeter with $\pm 0.1V$ accuracy.
- Voltmeter can display input or output voltage and can be turned on/off.
- Self-calibration function for voltage measurement.

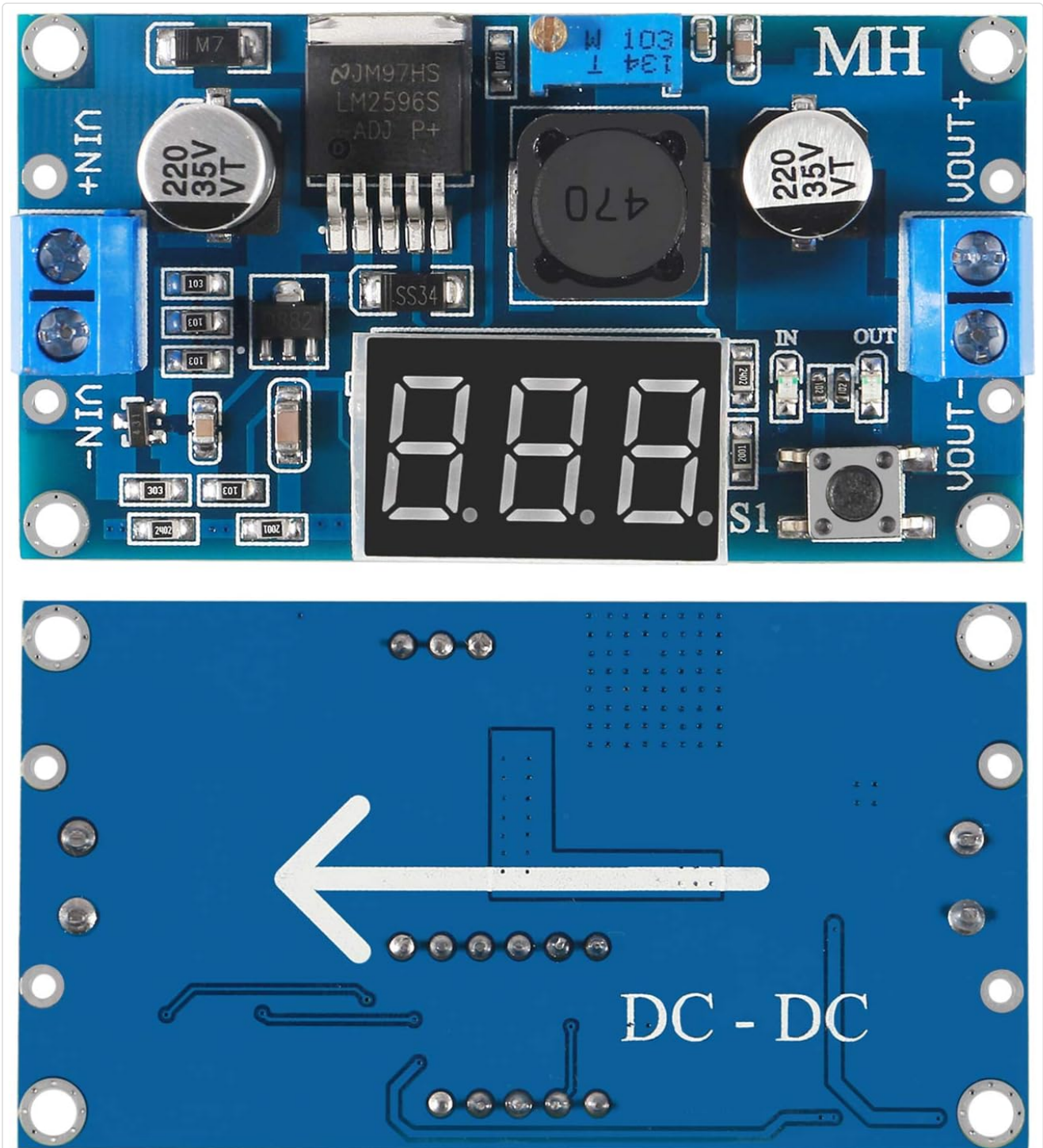


Figure 1: Top view of the LM2596S DC-DC Buck Converter module, highlighting the input/output terminals, LED display, and voltage adjustment potentiometer.

SPECIFICATIONS

Parameter	Value
Module Model	LM2596 Buck Converter + Voltmeter
Cutting Size	66.04mm x 35.05mm (approx. 2.59in x 1.41in)
Input Voltage	DC 4.2V - 40V (Note: Voltmeter requires >4V)
Output Voltage	1.25V - 37V (Continuously adjustable)
Output Current	2A (Normal/Stable), 3A (Max)
Voltage Conversion Efficiency	Up to 96%
Ripple Frequency	About 150KHz
Ripple Peak	About 100mV
Voltmeter Error	±0.1V

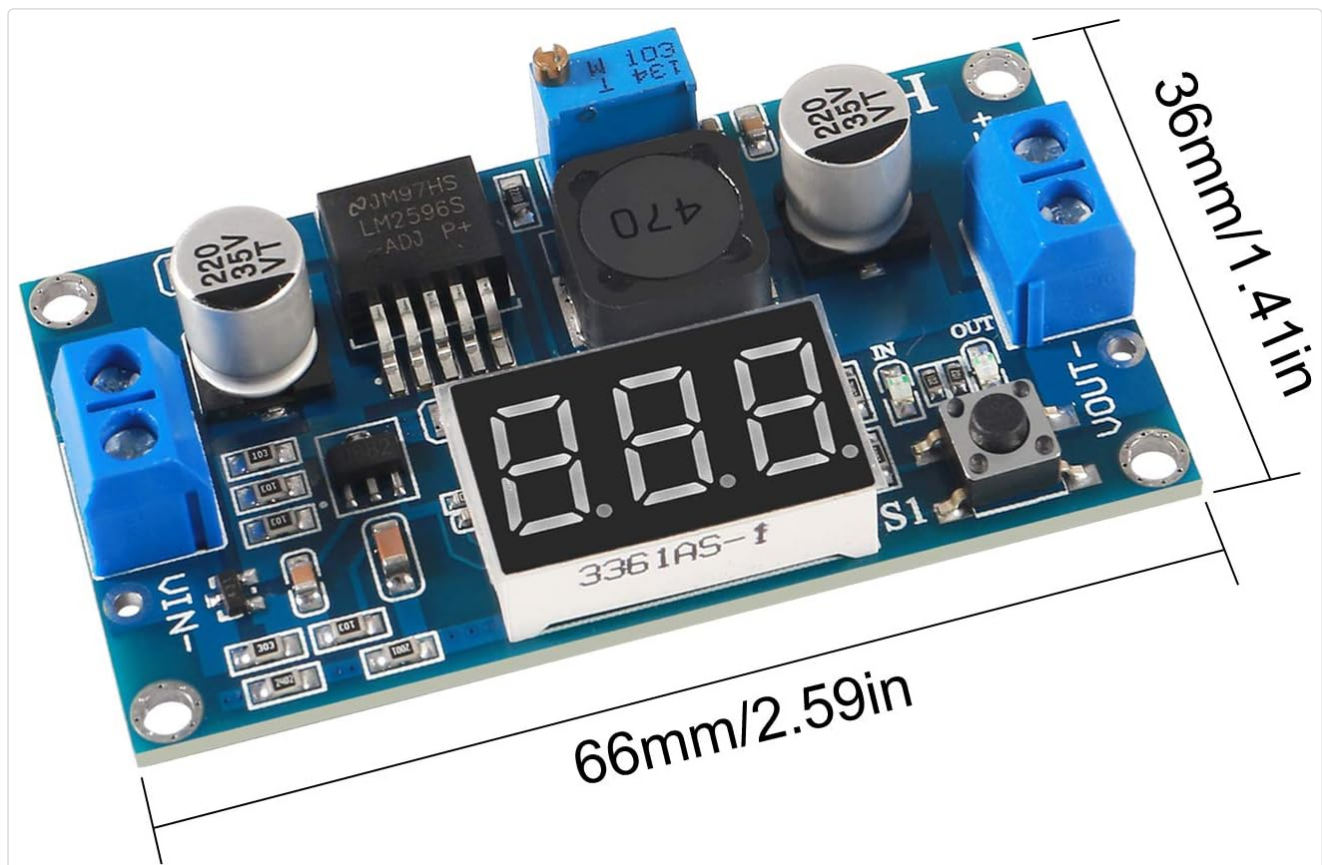


Figure 2: Module dimensions for the LM2596S DC-DC Buck Converter.

SETUP: WIRING CONNECTION

Follow these steps to correctly connect the module:

1. **IN+**: Connect your positive input power supply to the IN+ terminal.
2. **IN-**: Connect your negative input power supply to the IN- terminal.
3. **OUT+**: Connect the positive terminal of your load (device to be powered) to the OUT+ terminal.
4. **OUT-**: Connect the negative terminal of your load to the OUT- terminal.

Important: Ensure the input voltage is at least 1V higher than your desired output voltage. Do not reverse input/output polarity.

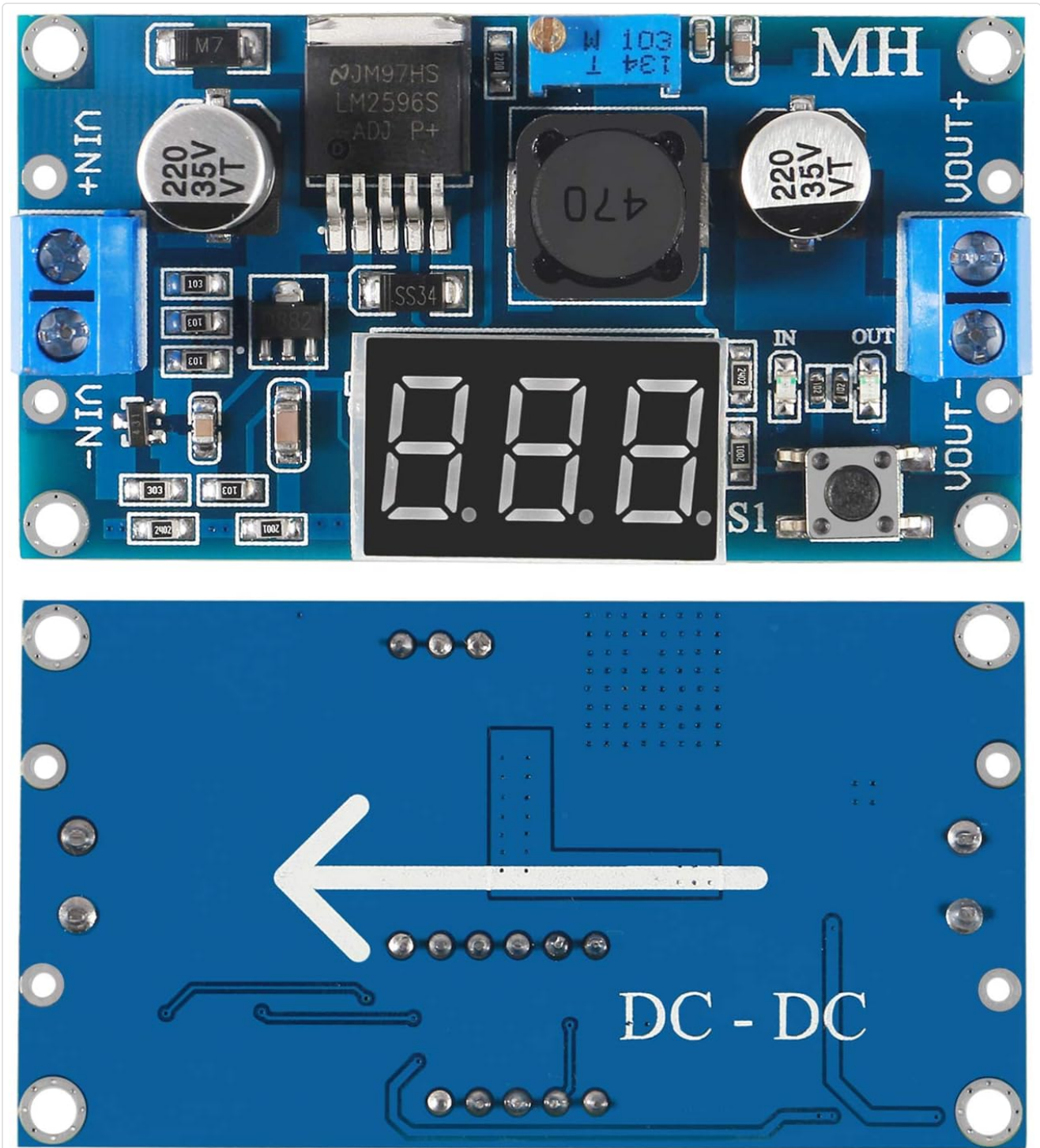


Figure 3: Wiring terminals on the LM2596S module.

1. Adjusting Output Voltage

Use a mini screwdriver to adjust the multi-turn potentiometer (blue component with a screw) on the module. Turning clockwise increases the voltage, and counter-clockwise decreases it. When using for the first time, it may be necessary to turn the potentiometer counter-clockwise more than 10 times before the output voltage changes significantly.

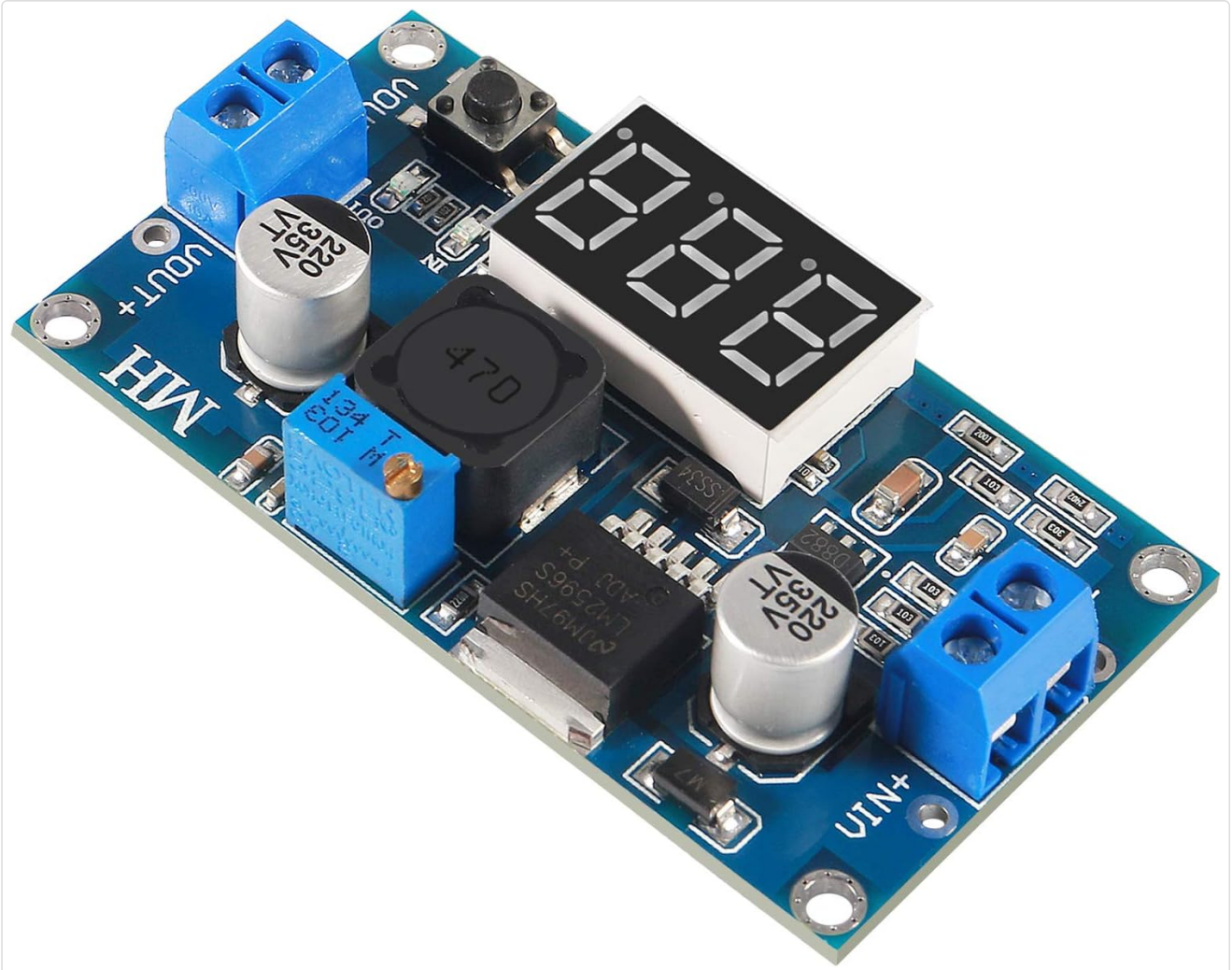


Figure 4: Location of the voltage adjustment potentiometer.

2. Voltmeter Operation

The module features a digital LED voltmeter to display voltage. There is a button next to the voltmeter (labeled S1 or similar) to control its functions:

- **Short Press:** Toggles between displaying input voltage (red LED lights) and output voltage (green LED lights).
- **Long Press (1-4 seconds):** Turns the voltmeter display ON or OFF.

3. Voltmeter Self-Calibration (Optional for high accuracy)

If highly accurate voltage readings are required, you can calibrate the voltmeter:

1. **Enter Calibration Mode:** Long press the left button (ON/OFF button, if present, or the main mode button) for more than 4 seconds. The "IN" indicator LED will light up, indicating input voltage measurement calibration has started.

2. **Adjust Input Voltage Calibration:** Tap the left or right button to reduce or increase the displayed voltage value. Each tap adjusts by a small unit (less than 0.1V), so multiple taps may be needed to see a 0.1V change.
3. **Switch to Output Voltage Calibration:** Long press the right button (Mode button) for more than 2 seconds. The "OUT" indicator LED will light up, indicating output voltage measurement calibration has started.
4. **Adjust Output Voltage Calibration:** Similar to step 2, tap the left or right button to adjust the output voltage display.
5. **Save Calibration:** After completing both input and output calibrations, long press the right button (Mode button) for more than 2 seconds to save the adjusted values. The module will return to normal voltage display, and the calibration settings will be preserved even after power loss.

APPLICATIONS

This versatile buck converter module can be used in various scenarios:

- Educational experiments and teaching.
- Temporary power supply setups in outdoor environments.
- Car audio systems and electric fan power supplies.
- General electronics projects requiring a regulated step-down DC voltage.

MAINTENANCE

- **Heat Management:** When operating at higher currents (above 2A) or power (above 15W) for extended periods, it is crucial to attach a heat sink to the main IC (LM2596S) to prevent overheating and ensure stable operation and longevity.
- **Cleaning:** Keep the module free from dust and debris. Use a soft, dry brush or compressed air for cleaning. Avoid liquids.
- **Storage:** Store the module in a dry, anti-static environment when not in use.



Figure 5: Bottom view of the module, useful for understanding component placement for heat sinking.

TROUBLESHOOTING

- **No Output Voltage:**

- Verify input voltage is present and within the 4.2V-40V range.
- Ensure input voltage is at least 1V higher than the desired output voltage.
- Check wiring for correct polarity and secure connections.
- Turn the potentiometer counter-clockwise multiple times (10+ rotations) when first setting up, as it might be at its maximum setting.

- **Incorrect Voltage Reading on Voltmeter:**

- Perform the voltmeter self-calibration procedure as described in the Operating Instructions.
- Ensure input voltage is above 4V for accurate voltmeter operation.

- **Module Overheating:**

- Reduce the output current or power draw.
- Install a suitable heat sink on the LM2596S chip.
- Ensure adequate airflow around the module.
- Avoid large input-output voltage differentials at high currents, as this increases heat dissipation.

- **Unstable Output Voltage:**

- Check for loose connections or faulty wiring.
- Ensure the load current does not exceed the module's stable operating current (2A).

- Verify the input power supply is stable.

WARRANTY INFORMATION

DORHEA products are typically covered by a standard manufacturer's warranty against defects in materials and workmanship. Please refer to your purchase documentation or contact the seller for specific warranty terms and duration. This warranty does not cover damage caused by improper use, exceeding specifications, or unauthorized modifications.

CUSTOMER SUPPORT

For technical assistance, troubleshooting, or further inquiries regarding your DORHEA LM2596S DC-DC Buck Converter, please contact your retailer or visit the DORHEA brand store on Amazon:

[Visit the DORHEA Store](#)

When contacting support, please have your product model number (LM2596 Buck Converter) and purchase details available.

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