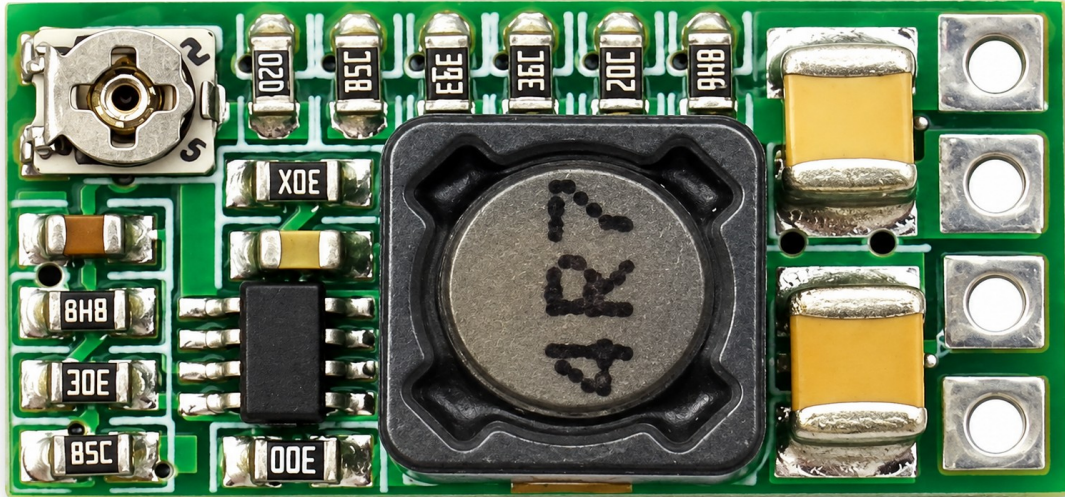


3A High-Efficiency Buck Converter

PRODUCT SPECIFICATION AND USER GUIDE



3 A adjustable/fixed-output step-down converter module

Product Description

This compact high-efficiency DC-DC buck converter accepts a 4.5–24 V DC input. It supports an adjustable 0.8–17 V output and selectable fixed output settings of 1.8 V, 2.5 V, 3.3 V, 5 V, 9 V or 12 V. Its narrow 20 × 11 mm board is intended for space-constrained embedded, portable and model-electronics power conversion.

Important: This is a step-down converter. Set and verify the output voltage with a multimeter before connecting the load. The input must remain above the selected output voltage, and the source must maintain adequate voltage under load.

Electrical Specifications

Parameter	Specification	Conditions and notes
Converter type	Non-isolated DC-DC buck	Input and output grounds are common
Input voltage	4.5–24 V DC	Maintain correct polarity; do not exceed the listed range
Adjustable output	0.8–17 V DC	Set with the onboard potentiometer
Selectable fixed outputs	1.8, 2.5, 3.3, 5, 9 or 12 V	Select on the rear configuration pads
Maximum output current	3 A	Thermal validation is required for sustained loading
Maximum efficiency	Up to 97.5%	Actual efficiency depends on input, output and load
Output mode	Adjustable or fixed	Configure before connecting the load

Mechanical Dimensions

Feature	Dimension	Notes
Board length	Approx. 20 mm	Overall PCB length
Board width	Approx. 11 mm	Overall PCB width
Connection-hole diameter	Approx. 1 mm	Four holes arranged along one end

Absolute Application Limits

- Do not reverse the input polarity.
- Do not short the output.
- Do not apply voltage to the output when the input is unpowered unless the complete system has been verified for backfeed behavior.
- Do not set the output above 17 V or above a safe voltage for the connected load.
- Peak-current and peak-efficiency values are not continuous guarantees; verify the module under the actual load and enclosure temperature.

Connections

Terminal	Function	Wiring
VIN+	Positive DC input	Connect to the positive terminal of the 4.5–24 V source
VIN–	Input return / ground	Connect to source negative
VOUT+	Regulated positive output	Connect to load positive after configuring the voltage
VOUT–	Output return / ground	Connect to load negative

Input and output negative terminals share a common ground. The module is not galvanically isolated.

Installation

1. Inspect the module for damage, solder bridges or loose components.
2. Identify the input and output pads from the markings on the received board. With power disconnected, solder short and adequately sized wires.
3. Before connecting the load, apply input power and measure the voltage between VOUT+ and VOUT– with a multimeter.
4. For adjustable operation, turn the potentiometer slowly until the required output voltage is reached. For fixed operation, configure the rear selection pads before applying power.
5. Connect the load with correct polarity, restore power and confirm the loaded output voltage.
6. Measure the loaded output voltage and monitor module temperature during the first extended test.
7. For high-current operation, provide airflow and confirm acceptable temperature rise in the final enclosure.

Recommended Wiring

- Keep input and output leads short to reduce voltage drop and noise.
- Use conductor size appropriate for the expected current.
- Place additional input/output capacitors near the module if the source or load has long wires or severe transients.
- Add an input fuse when the source can supply high fault current.
- For vehicle or industrial systems, evaluate surge, reverse-polarity and EMI protection at the system level.

Typical Applications

Input source	Load example	Design consideration
5–12 V adapter	Embedded controller or sensor	Set the output before connecting the load
12–24 V system	Monitoring or camera electronics	Keep input within the 24 V maximum
Vehicle electrical system	Low-voltage accessory electronics	Add surge and reverse-polarity protection
2S–5S lithium battery	Telemetry or control electronics	Verify the full charged and discharged battery range
Portable DC supply	Communications equipment	Check cable drop and enclosure temperature

Troubleshooting

Symptom	Likely cause	Corrective action
No output	No input, reversed polarity, broken connection or damaged module	Remove power and verify source voltage, polarity and solder joints
Wrong output voltage	Potentiometer setting or measurement error	Disconnect the load and set the output with a multimeter
Output voltage sags	Input sag, overload or excessive wiring resistance	Measure VIN under load; reduce load and shorten or enlarge conductors
Module overheats	Continuous current too high, poor airflow or high ambient temperature	Disconnect power; reduce current and improve cooling
Load resets	Transient current exceeds available margin	Add local output capacitance and verify startup current
Excessive noise	Long wiring, poor grounding or sensitive load layout	Shorten wiring, improve grounding and add appropriate filtering

Safety and Revision Note

This open-frame module is a component for integration, not a certified finished power supply. Protect it from moisture, conductive debris, accidental contact and short circuits. This specification applies only to the compact 3 A adjustable/fixed-output high-efficiency version. Component markings and board revisions may vary; verify received hardware before production or safety-critical use.