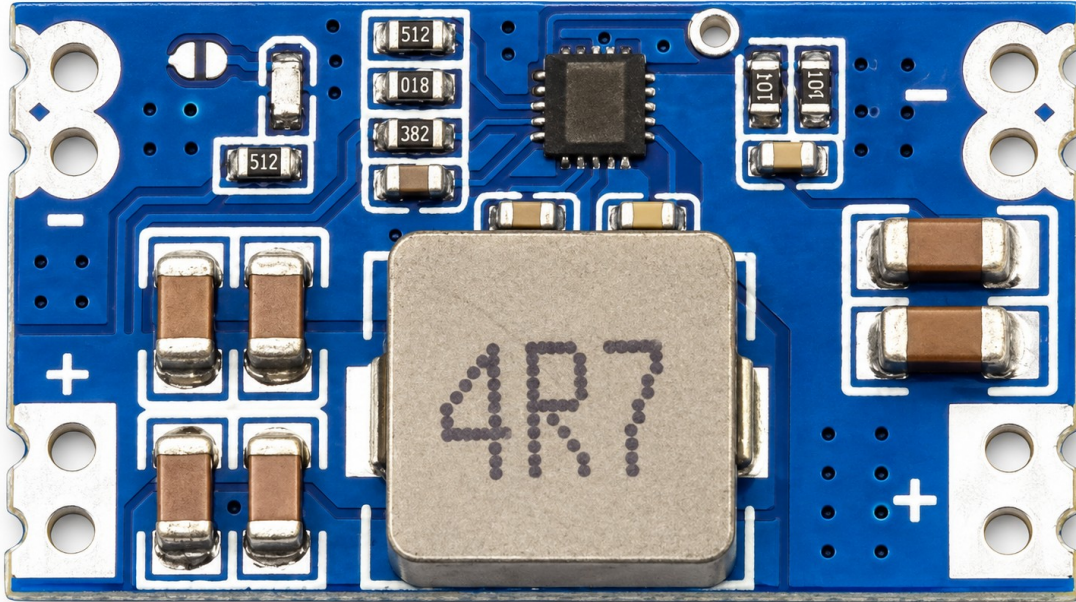


MINI560 3.3V 5A Buck Converter

PRODUCT SPECIFICATION AND USER GUIDE



MINI560 fixed 3.3 V step-down converter module

Product Description

This compact MINI560 synchronous DC-DC buck converter accepts a 5-20 V DC input and provides a fixed regulated 3.3 V output. The module supports high-current step-down conversion in embedded systems, model electronics, communications equipment, monitoring devices and vehicle-powered accessories.

Important: This is a step-down converter. Maintain more than 1.7 V between the input and the 3.3 V output. Verify polarity and output voltage before connecting the load, and provide additional cooling for sustained current above 4 A.

Electrical Specifications

Parameter	Specification	Conditions and notes
Converter type	Non-isolated DC-DC buck	Input and output grounds are common
Controller family	MINI560	Synchronous step-down module
Input voltage	5-20 V DC	Maintain correct polarity; do not exceed the listed range
Output voltage	3.3 V fixed	No user adjustment
Output current	<5 A	Additional cooling is required for sustained current above 4 A
Input-output differential	>1.7 V	Maintain adequate headroom under load
Maximum efficiency	Up to 99%	Actual efficiency depends on input, output and load
Switching frequency	500 kHz	Nominal rating
Operating temperature	-40 to +85 °C	Electrical and thermal derating may be required

Mechanical Dimensions

Feature	Dimension	Notes
Board length	Approx. 30 mm	Overall PCB length
Board width	Approx. 18 mm	Overall PCB width

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 use this fixed 3.3 V version where another output voltage is required.
- The maximum current and efficiency values are not unconditional continuous guarantees; verify temperature under the actual load and enclosure conditions.

Connections

Terminal	Function	Wiring
VIN+	Positive DC input	Connect to the positive terminal of the 5-20 V source
VIN-	Input return / ground	Connect to source negative
VOUT+	Regulated +3.3 V output	Connect to load positive
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 verify approximately 3.3 V between VOUT+ and VOUT- with a multimeter.
4. Connect the load with correct polarity, restore power and confirm the loaded output voltage.
5. Measure the loaded output voltage and monitor module temperature during the first extended test.
6. Provide additional cooling for sustained current above 4 A 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
6-12 V adapter	Embedded controller or sensor	Confirm startup and peak load current
12-20 V system	Monitoring or camera electronics	Keep input within the 20 V maximum
Vehicle electrical system	3.3 V accessory electronics	Add surge and reverse-polarity protection
3S-4S lithium battery	Telemetry or control electronics	Verify the full charged and discharged battery range
Portable DC supply	3.3 V 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
Output below 3.3 V	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 MINI560 fixed 3.3 V version. Component markings and board revisions may vary; verify received hardware before production or safety-critical use.