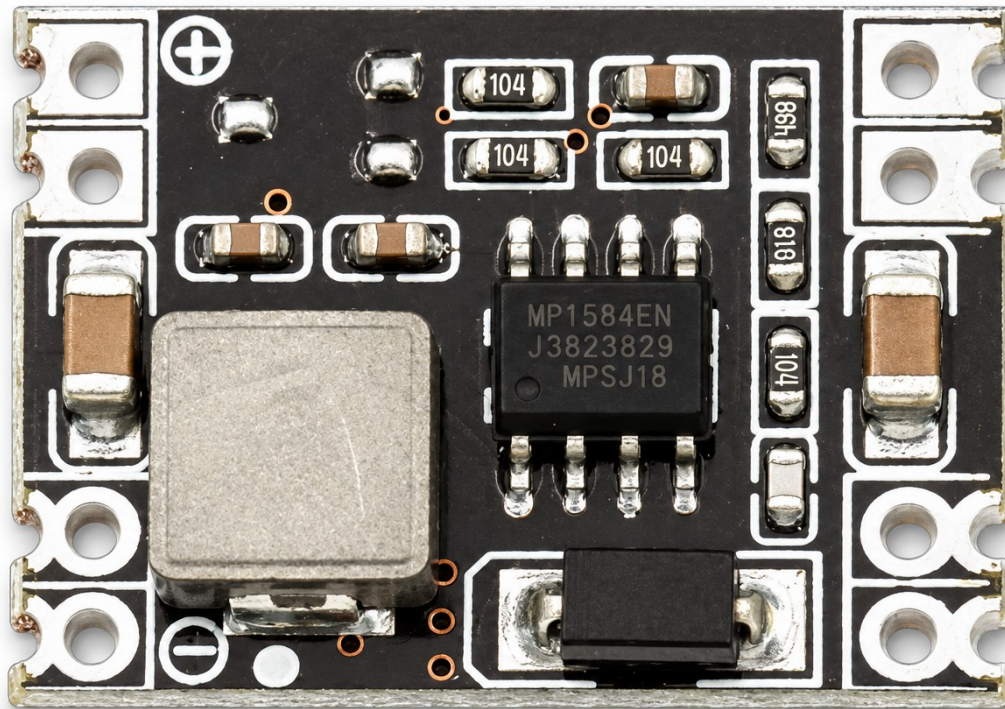


# MP1584EN 12V Fixed Output Buck Converter

## PRODUCT SPECIFICATION AND USER GUIDE



MP1584EN fixed 12 V step-down converter module

### Product Description

This compact MP1584EN-based DC-DC buck converter accepts a 14–26 V DC input and provides a fixed regulated 12 V output. The module is designed for space-constrained low-voltage power conversion in embedded controllers, cameras, communications equipment, model electronics, monitoring systems and vehicle-powered accessories.

**Important:** This is a step-down converter. The input must remain above the 12 V output, and the source must maintain adequate voltage under load. Verify input polarity and output voltage before connecting the load.

## Electrical Specifications

| Parameter                      | Specification           | Conditions and notes                                                 |
|--------------------------------|-------------------------|----------------------------------------------------------------------|
| Converter type                 | Non-isolated DC-DC buck | Input and output grounds are common                                  |
| Controller                     | MP1584EN                | Synchronous step-down regulator module                               |
| Input voltage                  | 14–26 V DC              | Maintain correct polarity; do not exceed the listed range            |
| Output voltage                 | 12 V fixed              | No user adjustment                                                   |
| Peak output current            | 3 A                     | Short-duration peak rating                                           |
| Recommended continuous current | ≤0.8 A                  | Use airflow and suitable wiring; derate for high ambient temperature |
| Peak efficiency                | Up to 96%               | Higher efficiency when VIN – VOUT is at least 2 V                    |
| Output ripple                  | <30 mV                  | Measurement bandwidth and load are not specified                     |
| Operating temperature          | –40 to +85 °C           | Electrical and thermal derating may be required                      |
| Module dimensions              | Approx. 21.5 × 16 mm    | Board outline excluding connected wiring                             |
| Terminal spacing               | Approx. 8 mm            | Center-to-center spacing within each terminal pair                   |

## 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 12 V version where another output voltage is required.
- Peak-current and peak-efficiency values are not continuous guarantees; verify the module under the actual load and enclosure temperature.

## Connections

| Terminal | Function               | Wiring                                                 |
|----------|------------------------|--------------------------------------------------------|
| IN+      | Positive DC input      | Connect to the positive terminal of the 14–26 V source |
| IN–      | Input return / ground  | Connect to source negative                             |
| OUT+     | Regulated +12 V output | Connect to load positive                               |
| OUT–     | 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. With power disconnected, solder short and adequately sized wires to IN+, IN–, OUT+ and OUT–.
3. Before connecting the load, apply the input voltage and verify approximately 12 V between OUT+ and OUT– with a multimeter.
4. Disconnect input power, connect the 12 V load with correct polarity, then restore power.
5. Measure the loaded output voltage and monitor module temperature during the first extended test.
6. If continuous current approaches 0.8 A, 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        | 12 V load example                 | Design consideration                                 |
|---------------------|-----------------------------------|------------------------------------------------------|
| 18 V adapter        | Embedded controller or instrument | Confirm startup and peak load current                |
| 24 V system         | Monitoring or camera electronics  | Add transient protection where required              |
| 24 V vehicle system | 12 V accessory electronics        | Vehicle surges can exceed the nominal supply voltage |
| Model battery pack  | Telemetry or control electronics  | Ensure the full battery range remains within 14–26 V |
| 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    |
| Output below 12 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 MP1584EN fixed 12 V version. Component markings and board revisions may vary; verify received hardware before production or safety-critical use.