

# Kalem-TPS5430-StepDown-Selectable

Adjustable DC-DC step-down (buck) power supply module

Compact high-efficiency DC-DC buck converter module based on the TPS5430 regulator, designed for 12–24 V industrial systems with selectable output voltage.

## 1. Overview

The Kalem-TPS5430-StepDown-Selectable module is a compact DC-DC buck converter designed to efficiently step down 12–24 V DC input voltages to lower regulated output voltages suitable for microcontrollers, sensors and industrial electronics.

The module is based on the Texas Instruments TPS5430 switching regulator, capable of delivering up to 3 A output current with high efficiency. Output voltage is set via a selectable feedback resistor network, allowing multiple predefined output voltages using jumpers or solder links.

An ENABLE pin is provided for external on/off control. The board includes proper input filtering, output filtering and protection components suitable for industrial environments.

## 2. Features

- Wide input voltage range: 7–24 V DC
- Adjustable output voltage via selectable feedback resistors
- Up to 3 A continuous output current (thermal dependent)
- High efficiency synchronous buck topology
- Fixed 500 kHz switching frequency
- ENABLE pin for external on/off control
- Input power LED indicator
- Screw terminal connectors for VIN and VOUT

## 4. Pinout and Connections

### 4.1 Power input

- VIN – Input supply voltage (7–24 V DC nominal)
- GND – Common ground reference

## 4.2 Power output

- VOUT – Regulated output voltage
- GND – Output ground (same as input ground)

## 4.3 Control and feedback

- ENABLE – Logic control input (LOW < 0.5 V disables the regulator)
- FB / FEEDBACK – Feedback node for output voltage selection

## 5. Electrical Characteristics and Operation

The TPS5430 operates as a current-mode PWM buck regulator with a fixed internal switching frequency of 500 kHz. The output voltage is regulated by comparing the feedback voltage to an internal 1.221 V reference.

Output voltage is defined by the external feedback resistor network. Multiple resistor values can be selected using jumpers or solder bridges, allowing the same board to generate different output voltages.

The ENABLE pin allows the regulator to be turned on and off by an external control signal. If the pin is left floating, the internal pull-up enables the regulator by default.

## 6. Application Guidelines

- Ensure adequate airflow or copper area for heat dissipation at high load currents.
- Use short and wide traces for VIN, VOUT and GND to minimize losses.
- Do not exceed the maximum rated input voltage of the TPS5430.
- Verify output voltage selection before connecting sensitive loads.
- Use the ENABLE pin to sequence power if required by the system.

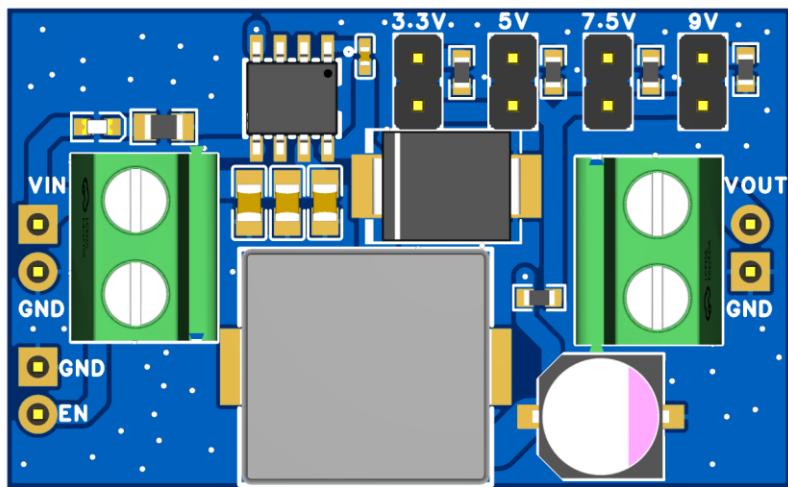
## 8. Absolute Maximum Ratings (summary)

- Input voltage (VIN to GND): -0.3 V to +25 V
- Output current: limited by thermal performance and components
- Operating ambient temperature: -20 °C to +70 °C
- Storage temperature: -40 °C to +85 °C

These are stress ratings only. Functional operation is not guaranteed beyond the recommended operating conditions.

## 9. Board Views and Mechanical Drawing

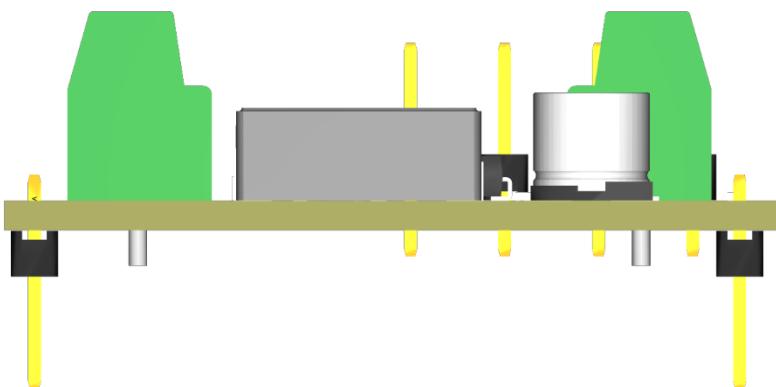
### 9.1 Top view



### 9.2 Bottom view



### 9.3 Side view



#### 9.4 Technical drawing

