

Boost 12 Click



PID: MIKROE-6861

Boost 12 Click is a compact add-on board designed for high-voltage DC-DC step-up power conversion for embedded, industrial, and communication systems that require flexible input compatibility and precise output regulation. This board is based on the [TPS61170](#), a monolithic high-voltage switching regulator from [Texas Instruments](#) that integrates a power MOSFET and supports a wide input voltage range from 3V to 18V for operation from multicell batteries or regulated 5V and 12V power rails. Featuring built-in soft start, pulse-by-pulse overcurrent protection, thermal shutdown, and PWM-based digital adjustment of the output voltage, this Click offers reliable, safe, and adaptable power management, along with Click Snap support. It is ideally suited for general boost converter designs, ADSL modems, and embedded applications that demand efficient, controllable, and high-voltage power delivery.

For more information about **Boost 12 Click** visit the official [product page](#).

How does it work?

Boost 12 Click is based on the TPS61170, a monolithic high-voltage switching regulator from Texas Instruments that integrates a power MOSFET and supports a wide input voltage range from 3V to 18V, making it suitable for applications powered by multicell battery packs as well as regulated 5V and 12V power rails. Featuring built-in soft-start functionality, pulse-by-pulse overcurrent protection, and thermal shutdown, the TPS61170 ensures reliable operation, enhanced system safety, and long-term stability under dynamic load and thermal conditions. The Boost 12 Click is well suited for general boost converter applications, ADSL modems, and a broad range of embedded designs that require efficient, controllable, and high-voltage power delivery.

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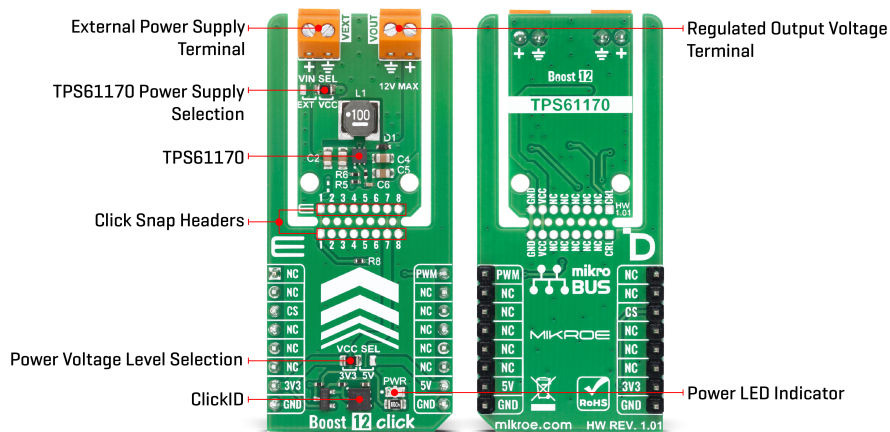
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the TPS61170 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

The device regulates its output through a feedback reference voltage of 1.229V on the FB pin, which can be dynamically adjusted using a pulse width modulation signal (PWM), allowing the duty cycle to proportionally lower the effective feedback reference and providing precise digital control of the output voltage. This pin is also multifunctional and further extends system flexibility by enabling the device, besides PWM-based feedback control, and allowing digital communication for advanced power management strategies.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

Type	Boost
Applications	Ideal for general boost converter designs, ADSL modems, and embedded applications that demand efficient, controllable, and high-voltage power delivery
On-board modules	TPS61170 - high voltage boost converter from

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	Texas Instruments
Key Features	High-voltage DC-DC step-up power conversion, wide input voltage range, integrated power MOSFET, built-in soft-start functionality, pulse-by-pulse overcurrent protection, thermal shutdown protection, PWM-based digital output voltage adjustment, Click Snap format, and more
Interface	PWM
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V, External

Pinout diagram

This table shows how the pinout on Boost 12 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS				Pin	Notes
	NC	1	AN	PWM	16	PWM	PWM Signal
	NC	2	RST	INT	15	NC	
ID COMM	CS	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
Power Supply	3.3V	7	3.3V	5V	10	5V	Power Supply
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	VIN SEL	Right	TPS61170 Power Supply Selection EXT/VCC: Left position EXT, Right position VCC

Boost 12 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	3	-	18	V
Output Voltage	-	-	12	V

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Software Support

[Boost 12 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

Example Description

This example demonstrates the use of the Boost 12 Click board, changing the output voltage by generating a PWM signal whose duty cycle is gradually increased and decreased between 10% and 100%.

Key Functions

- `boost12_cfg_setup` This function initializes Click configuration structure to initial values.
- `boost12_init` This function initializes all necessary pins and peripherals used for this Click board.
- `boost12_default_cfg` This function executes a default configuration of Boost 12 Click board.
- `boost12_pwm_start` This function starts the PWM module output.
- `boost12_set_duty_cycle` This function sets the PWM duty cycle in percentages (Range[0..1]).

Application Init

Initializes the logger and Boost 12 Click driver and applies the default configuration.

Application Task

Adjusts the PWM duty cycle in 1% steps, logs the current value, and smoothly oscillates the duty between minimum and maximum levels.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

Resources

[mikroBUS™](#)

[mikroSDK](#)

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[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Boost 12 click example package](#)

[Boost 12 click 2D and 3D files v101](#)

[Boost 12 click schematic v101](#)

[TPS61170 datasheet](#)

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