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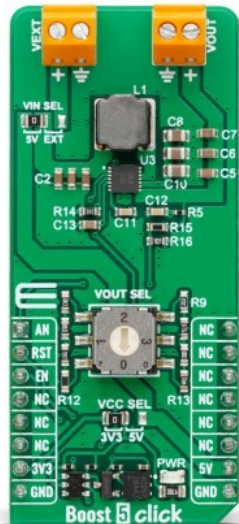www.mikroe.com

Boost 5 Click

PID: MIKROE-6549

Boost 5 Click is a compact add-on board that boosts voltage for battery-powered and low-power applications. This board features the MAX17250, a high-efficiency synchronous boost converter from Analog Devices, featuring True Shutdown™ and ultra-low quiescent current operation. This Click board™ supports input voltages from 2.7V to 18V and delivers regulated output voltages of 8V, 10V, 12V, or 14V, selectable via an onboard switch with peak current limit of 3.5A. It includes short-circuit protection, Pulse Frequency Modulation (PFM) for minimal power consumption, and offers flexible power sourcing through a VIN SEL jumper, allowing users to choose between an internal mikroBUS™ 5V power rail or an external supply. Boost 5 Click is ideal for battery-powered IoT devices, single or dual-cell Li-Ion battery applications, display power supplies, and buzzer/alarm drivers where reliable and efficient voltage step-up is required.

For more information about **Boost 5 Click** visit the official product page.

How does it work?

Boost 5 Click is based on the MAX17250, a DC-DC synchronous step-up converter from Analog Devices. Designed to deliver exceptional power efficiency with minimal energy consumption, this Click board™ is ideal for battery-powered applications requiring a stable and reliable voltage boost. With its wide input voltage range, the MAX17250 steps up the voltage to as high as 14V (with peak current limit of 3.5A) while maintaining a low quiescent current operation. One of its standout features is True Shutdown™. This unique capability ensures complete disconnection of the output from the input, reducing battery drain to a mere 0.1µA in shutdown mode, significantly extending battery life in portable and low-power applications, including battery-powered IoT devices, single or dual-cell Li-Ion battery-powered systems, buzzer/alarm

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drivers, as well as display power supplies.
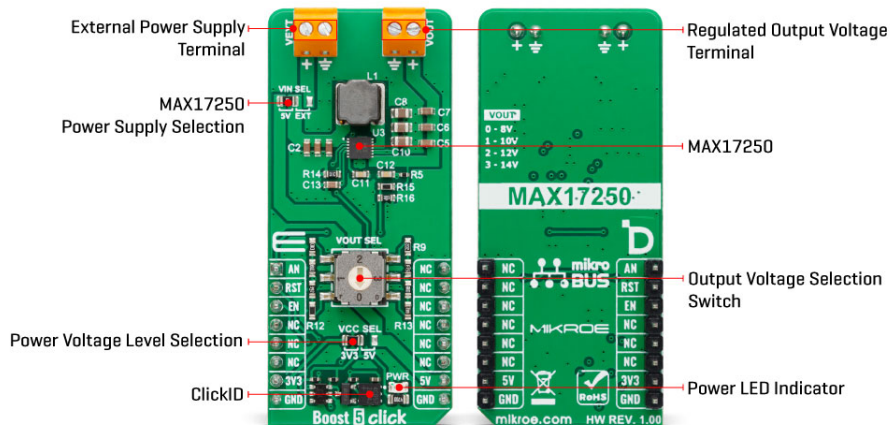
The MAX17250 operates in three operational modes to optimize performance based on the system's requirements. At startup, the soft-start mode ensures a smooth power-up sequence, preventing inrush currents that could destabilize the system. Once operational, the converter functions using a fixed on-time and minimum off-time Pulse Frequency Modulation (PFM) architecture, which only activates the switching regulator when necessary, achieving an ultra-low typical quiescent current of just 60µA. Additionally, its integrated short-circuit protection further enhance reliability and safe operation under varying load conditions.

This Click board™ features a four-position switch that allows users to select the desired regulated output voltage at the VOUT terminal, providing flexibility for different application needs. The switch positions correspond to four preset voltage levels: 8V at position 0, 10V at position 1, 12V at position 2, and 14V at position 3. Additionally, the board includes two pins for enhanced operation and monitoring. The EN pin serves as a device-enable control, allowing the user to activate or deactivate the boost converter as needed, while the AN pin functions as a digital output, providing real-time feedback on the board's output voltage at the VOUT terminal.

Boost 5 Click also offers versatile power sourcing options, allowing users to choose between internal and external supplies to best suit their application needs. This flexibility is achieved through the VIN SEL jumper, which enables users to select the 5V position for sourcing power internally via the 5V mikroBUS™ power rail or the EXT position to connect an external power supply (supplied via the VEXT terminal). The external power supply can range from 2.7V to 18V, providing a wide voltage range for various project requirements.

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.

Specifications

Type	Boost
Applications	Ideal for battery-powered IoT devices, single or dual-cell Li-Ion battery applications, display power supplies, and buzzer/alarm drivers

On-board modules	MAX17250 - DC-DC boost converter from Analog Devices
Key Features	DC-DC step-up (boost) converter, wide input voltage and selectable output voltages, ultra-low quiescent current, True Shutdown™ mode, Pulse Frequency Modulation (PFM) architecture, short-circuit protection, and more
Interface	Analog,GPIO
Feature	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 5 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro BUS			Pin	Notes
Analog Output	**AN**	1	AN	PWM	16	NC	
ID SEL	**RST**	2	RST	INT	15	NC	
Device Enable / ID COMM	**EN**	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	Lower	Output Voltage Selection Switch 8V/10V/12V/14V: Lower position 8V, Left position 10V, Upper position 12V, Right position 14V
SW1	VOUT SEL	Left	MAX17250 Power Supply Selection 5V/EXT: Left position 5V, Right position EXT

Boost 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	2.7	-	18	V
Output Voltage	8	-	14	V
Peak Current Limit	-	-	3.5	A

Software Support

Boost 5 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 5 Click board by enabling the device and continuously reading and logging the measured output voltage (VOUT). If a failure is detected during voltage reading, the device is reset.

Key Functions

- boost5_cfg_setup This function initializes Click configuration structure to initial values.
- boost5_init This function initializes all necessary pins and peripherals used for this Click board.
- boost5_enable_device This function enables device by setting the EN pin to high logic state.
- boost5_reset_device This function resets device by toggling the EN pin logic state.
- boost5_read_vout This function reads the boost output voltage level.

Application Init

Initializes the logger and the Boost 5 Click board. Configures the ADC for voltage measurements and enables the device to prepare it for operation.

Application Task

Reads the output voltage level and logs it on the USB UART. In case of an error during the reading process, or the user changes VOUT using an on-board VOUT SEL switch, the device is reset to recover from potential issues or to apply new settings.

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

Click board™ Catalog

Click boards™

ClickID

Downloads

Boost 5 click example package

Boost 5 click 2D and 3D files v100

MAX17250 datasheet

Boost 5 click schematic v100