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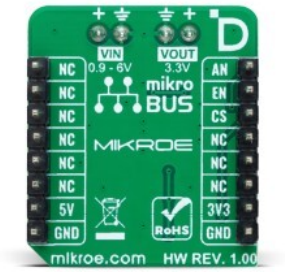
Boost 11 Click



PID: MIKROE-6061

Boost 11 Click is a compact add-on board that boosts low input voltages to a stable output. This board features the XCL105B331H2-G, a synchronous step-up DC/DC converter from TOREX Semi. It operates from an input voltage as low as 0.9V, ideal for devices using single Alkaline or Nickel-metal hydride batteries, with an output fixed at 3.3V. It features an EN pin for easy start-up and standby mode and supports both 3.3V and 5V logic levels. This versatility makes Boost 11 Click suitable for industrial equipment, IoT devices, wearables, and applications prioritizing battery life.

Boost 11 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this Click board™ apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

Boost 11 Click is based on the XCL105B331H2-G, a synchronous step-up DC/DC converter from TOREX Semi. This component includes a reference voltage source, ramp wave circuit, error amplifier, PWM comparator, phase compensation circuit, N-channel driver FET, P-channel synchronous switching FET, and current limiter circuit. It can start operating from an input voltage of 0.9V, making it suitable for devices using single Alkaline or Nickel-metal hydride batteries. The operating voltage range spans from 0.9V to 6V, which applies to the VIN terminal. This versatility makes it ideal for industrial equipment, Internet of Things (IoT) devices, wearables, and any applications prioritizing battery life.

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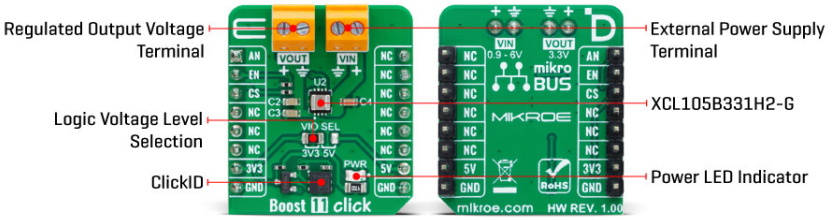

The XCL105B331H2-G operates by using the error amplifier to compare the internal reference voltage with the feedback voltage. The resulting output undergoes phase compensation and is fed to the PWM comparator. This comparator matches the signal from the error amplifier with the ramp wave circuit output, sending the resulting signal to the buffer driver circuit to control the PWM duty cycle. This continuous process stabilizes the output voltage, fixed at 3.3V and available at the VOUT terminal. Additionally, an output signal is available on the AN pin of the mikroBUS™ socket.

The Boost 11 Click uses the EN pin of the mikroBUS™ socket in addition to the AN pin. When the EN pin is set to a high logic level, the output voltage is raised via the Start-Up mode, initiating normal operation. When set to a low logic level, the IC enters Standby mode, significantly reducing current consumption.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VIO 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 industrial equipment, IoT devices, wearables, and applications prioritizing battery life
On-board modules	XCL105B331H2-G - synchronous step-up DC/DC converter from TOREX Semi
Key Features	Synchronous step-up DC/DC converter, wide input voltage range with a fixed output voltage, protection features like thermal shutdown and UVLO, suitable for devices powered by single Alkaline or Nickel-metal hydride batteries, control managed via mikroBUS™ pin, supports both 3.3V and 5V logic levels, and more
Interface	Analog,GPIO

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Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V,External

Pinout diagram

This table shows how the pinout on Boost 11 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Analog Output	**AN**	1	AN	PWM	16	NC	
Device Enable	**EN**	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	VIO SEL	Left	Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Boost 11 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	0.9	-	6	V
Regulated Output Voltage	-	3.3	-	V

Software Support

We provide a library for the Boost 11 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for Boost 11 Click driver.

Key functions

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- boost11_active_mode This function activates the boost operating mode.
- boost11_read_an_pin_voltage This function reads results of AD conversion of the AN pin and converts them to proportional voltage level.

Example Description

This example demonstrates the use of Boost 11 click board by controlling the output state.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Boost11

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

Boost 11 click example on Libstock

Boost 11 click 2D and 3D files v100

XCL105B331H2 datasheet

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Boost 11 Click schematic v100

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