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Buck 23 Click





PID: MIKROE-5536

Buck 23 Click is a compact add-on board with a DC-DC power converter that steps down the voltage from its input to its output. This board features the MAX20010C, a fully-integrated, high-efficiency, synchronous, step-down converter from Analog Devices. The MAX20010C achieves 6A continuous output current over a wide input supply range from 3V to 5.5V. It offers ±2% output voltage accuracy and can operate efficiently over interface-configurable output voltage load range from 0.5V to 1.58V. The MAX20010C also offers programmable soft-start, overcurrent, and overtemperature protections. This Click board™ is suitable for point-of-load and post-regulation applications.

Buck 23 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

Buck 23 Click is based on the MAX20010C, a high-efficiency, synchronous step-down converter from Analog Devices, providing interface-configurable output voltage range from 0.5V to 1.58V. The MAX20010C offers a factory-preset output voltage of 1V and supports dynamic voltage adjustment with programmable slew rates. Other features include programmable soft-start, overcurrent, and overtemperature protections. The wide input/output voltage range, ±2% output voltage accuracy, and the ability to provide up to 6A load current make this Click board™ an ideal solution for on-board point-of-load and post-regulation applications.

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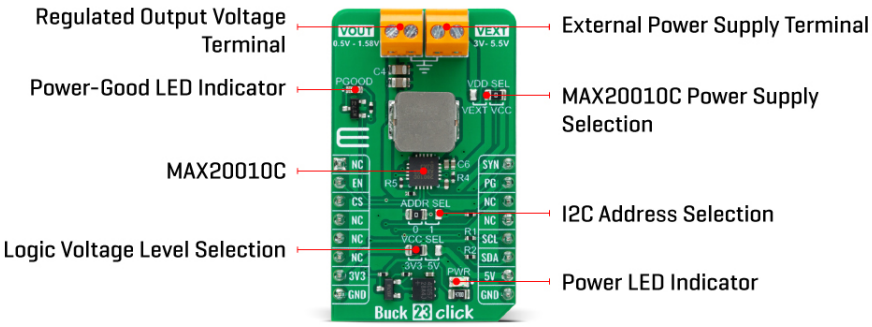

The MAX20010C features a synchronization input, marked as SYN and routed to the PWM pin of the mikroBUS™ socket, that puts the converter either in skip mode or forced-PWM mode of operation. In PWM mode, the converter switches at a constant frequency with variable on-time. In skip mode, the converter's switching frequency is load-dependent until the output load reaches a certain threshold.

This Click board™ communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings. Also, the MAX20010C allows choosing its I2C slave address using the SMD jumper labeled ADDR SEL. Besides, it also possesses a power-good function and a device-enable feature. The power-good feature is routed to the red LED marked as PGOOD and PG pin of the mikroBUS™ socket, indicating that the output reached regulation, while the EN pin serves for power ON/OFF purposes optimizing power consumption (converter operation permission).

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to use the communication lines properly. Additionally, there is a possibility for the MAX20010C power supply selection via jumper labeled as VDD SEL to supply the MAX20010C from an external power supply terminal in the range from 3V to 5.5V or with mikroBUS™ power rails. However, the 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	Buck
Applications	Can be used for point-of-load and post-regulation applications
On-board modules	MAX20010C - synchronous step-down converter from Analog Devices
Key Features	High efficiency, 6A output current, excellent load regulation, broad output voltage range selectable by serial interface, protection features, wide input range, selectable power supply, and more
Interface	I2C

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ClickID	Yes
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V,External

Pinout diagram

This table shows how the pinout on Buck 23 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	**SYN**	Synchronization
Enable	**EN**	2	RST	INT	15	**PG**	Power-Good
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
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
LD2	PGOOD	-	Power-Good LED Indicator
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1
JP3	VDD SEL	Right	MAX20010C Power Supply Selection VEXT/VCC: Left position VEXT, Right position VCC

Buck 23 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Power Supply	3	-	5.5	V
Output Voltage	0.5	-	1.58	V
Output Current	-	6	-	A

Software Support

We provide a library for the Buck 23 Click as well as a demo application (example), developed

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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 Buck 23 Click driver.

Key functions

- buck23_set_vstep This function sets the voltage output step to 10mV or 12.5mV.
- buck23_set_vout This function sets the voltage output.
- buck23_get_pg_pin This function returns the PG (power good) pin logic state.

Example Description

This example demonstrates the use of Buck 23 Click board™ by changing the output voltage.

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.Buck23

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

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Click boards™

ClickID

Downloads

Buck 23 click 2D and 3D files

Buck 23 click schematic

Buck 23 click example on Libstock

MAX20010C datasheet

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