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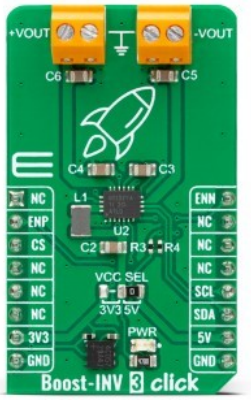
Boost-INV 3 Click



PID: MIKROE-5755

Boost-INV 3 Click is a compact add-on board designed to supply positive/negative-driven applications. This board features the TPS65132, a dual-output power supply from Texas Instruments. The TPS65132 uses a single inductor scheme for both outputs to provide the user with the smallest solution size and high efficiency. It also offers the best line and load regulation at low noise with a programmable output voltage via an I2C compatible interface, from -±4V to ±6V in 100mV steps (±5.4V pre-programmed output voltage with maximum 80mA output current). This Click board™ is the perfect solution for any application requiring positive and negative supplies.

How does it work?

Boost-INV 3 Click is based on the TPS65132, a dual-output power supply from Texas Instruments. The TPS65132 operates with a single inductor scheme to provide high efficiency with a small solution size. The synchronous boost converter generates a positive voltage regulated by an integrated LDO, providing the positive supply rail on the +VOUT terminal. The negative supply rail, available on the -VOUT terminal, is generated by an integrated negative charge pump driven from the boost converter output REG pin. The output voltage is programmable via an I2C compatible interface, from ±6V to ±4V in 100mV steps with ±5.4V pre-programmed output voltage and a maximum 80mA output current. Both output voltages can be set independently, and their sequencing is also independent.

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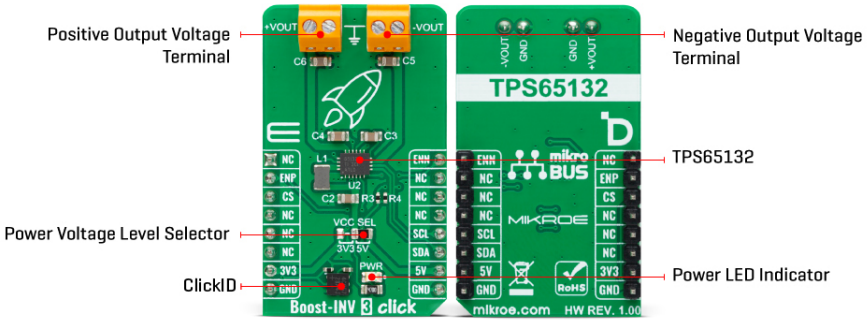

This Click board™ communicates with the host MCU using the standard I2C 2-Wire interface, with a maximum clock frequency in Fast data transfer of up to 400kHz (400kbps). Pulling ENP or ENN pins of the mikroBUS socket to a low logic state turns off either rail (+VOUT or -VOUT, respectively), and pulling both pins to a low logic state turns off the device entirely (the internal oscillator of the TPS65132 continues running to allow access to the I2C interface).

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. 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	Boost
Applications	Can be used for any application requiring positive and negative supplies
On-board modules	TPS65132 - dual-output power supply from Texas Instruments
Key Features	Single inductor scheme, programmable output voltage, I2C interface, outstanding efficiency, excellent performance, undervoltage lock-out and thermal protection, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Boost-INV 3 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

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Notes	Pin	mikro™ BUS				Pin	Notes
	NC	1	AN	PWM	16	**ENN**	Negative Voltage Rail Enable
Positive Voltage Rail Enable	**ENP**	2	RST	INT	15	NC	
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Data
	NC	6	MOSI	SDA	11	**SDA**	I2C Clock
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	-	Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Boost-INV 3 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Output Voltage Range	-6	-	6	V
Maximum Output Current	-	-	80	mA

Software Support

We provide a library for the Boost-INV 3 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-INV 3 Click driver.

Key functions

- boostinv3_set_enp Boost-INV 3 set ENP pin state function.
- boostinv3_set_pos_out Boost-INV 3 set positive output voltage function.
- boostinv3_set_neg_out Boost-INV 3 set negative output voltage function.

Example Description

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This library contains API for the Boost-INV 3 Click driver. This driver provides the functions to set the output voltage treshold.

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.BoostINV3

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-INV 3 click example on Libstock

Boost-INV 3 click 2D and 3D files

TPS65132 datasheet

Boost-INV 3 Click Schematic