

Current Limit 9 Click



PID: MIKROE-5937

Current Limit 9 Click is a compact add-on board representing a current-limiting solution for your application. This board features the NPS4053, a load switch with a precision adjustable current limit from Nexperia. It is a 5.5V, 55mΩ load switch that allows precise adjustment of the current limit in a range of 110mA up to 2.5A while preserving the constant current during the current limiting. This Click board™ makes the perfect solution for the development of USB ports/hubs, portable devices, current limit circuits, optical socket protections, and more.

Current Limit 9 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?

Current Limit 9 Click is based on the NPS4053, a load switch with a precision adjustable current limit from Nexperia. It limits the output current to a constant current using a constant-current mode when the output load exceeds the current limit threshold or is shorted. An internal voltage comparator turns off the load switch to protect devices on the input side of the switch when the output voltage is higher than the input. The other protections include active reverse voltage protection, ILIM pin protection, ESD protection, and more.

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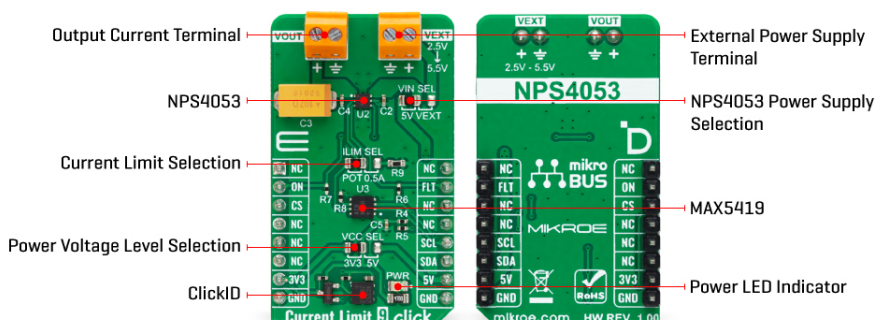
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The current to which you can set the limit over the Current Limit 9 Click board™ can be selected between external supply or 5V from the mikroBUS™ socket via the VIN SEL jumper. The external voltage can be in the range of 2.5 – 5.5V. It can use the [MAX5419](#), a 256-tap 200K nonvolatile digital potentiometer from Analog Devices, to set the current limit threshold to the NPS4053 over the ILIM pin. It can also use an onboard R9 resistor for a fixed 0.5A at 5V supply. The selection can be made over the ILIM SEL.

Current Limit 9 Click uses a standard 2-Wire I2C interface of the MAX5419 to allow the host MCU to set the desired current limit threshold, which supports a fast I2C interface. You can turn the current limit IC on or off over the ON pin. The FLT is an interrupt pin, and it is asserted to a low logic level during overcurrent, overtemperature, and reverse-voltage conditions.

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	Power Switch
Applications	Can be used for the development of USB ports/hubs, portable devices, current limit circuits, optical socket protections, and more
On-board modules	NPS4053 - a load switch with a precision adjustable current limit from Nexperia
Key Features	External or internal input operating voltage, maximum continuous current of 2A, adjustable current limit, ILIM pin protection, constant current during current limit, active reverse voltage protection, flag interrupt pin, built-in soft start, ESD protection, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)

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Input Voltage	3.3V or 5V
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Pinout diagram

This table shows how the pinout on Current Limit 9 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
Current Limit Enable	ON	2	RST	INT	15	FLT	Fault Interrupt
ID COMM	CS	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
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	ILIM SEL	Left	Current Limit Selection POT/0.5A: Left position POT, Right position 0.5A
JP3	VIN SEL	Left	NPS4053 Power Supply Selection 5V/VEXT: Left position 5V, Right position VEXT

Current Limit 9 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
External Supply Voltage	2.5	-	5.5	V
Fixed Current Limit	-	0.5	-	A
Programmable Current Limit Range	0.11	-	2.5	A

Software Support

We provide a library for the Current Limit 9 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

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(recommended), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Library Description

This library contains API for Current Limit 9 Click driver.

Key functions

- `currentlimit9_set_limit` This function sets the desired current limit threshold using the I2C serial interface.
- `currentlimit9_get_fault` This function gets the state of the fault flag to indicate overcurrent, overtemperature, or reverse-voltage conditions.
- `currentlimit9_enable` This function turns on the power switch and enables the internal MOSFET.

Example Description

This library contains API for the Current Limit 9 Click driver. This driver provides the functions to set the current limiting conditions in order to provide the threshold of the fault conditions.

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.CurrentLimit9

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](#)

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[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[MAX5419 datasheet](#)

[Current Limit 9 click example on Libstock](#)

[NPS4053 datasheet](#)

[Current Limit 9 click 2D and 3D files](#)

[Current Limit 9 click schematic](#)

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