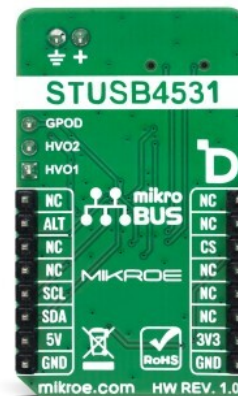
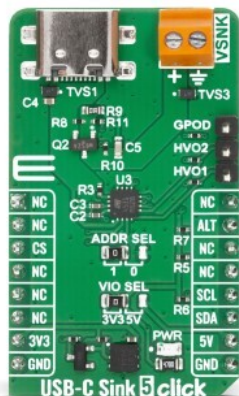


USB-C Sink 5 Click



PID: MIKROE-6934

USB-C Sink 5 Click is a compact add-on board designed for USB Type-C Power Delivery sink applications, enabling embedded systems to receive, negotiate, and manage power from USB-C PD-capable sources. This board is based on the [STUSB4531QTR](#), a standalone USB Type-C and USB Power Delivery sink controller from [STMicroelectronics](#). Key features include autonomous USB PD contract negotiation through Autorun mode, default PDO configuration stored in internal non-volatile memory, dead battery mode support, VBUS monitoring, input power path control, integrated protection and discharge functions, and high-voltage surge protection. The board communicates with the host MCU through an I2C interface with selectable addresses, provides an active-low open-drain interrupt, and includes high-voltage open-drain general-purpose outputs. It is suitable for USB-C powered devices, battery-powered accessories, industrial systems, IoT equipment, handheld devices, and DC barrel or USB micro-B replacement applications.

For more information about **USB-C Sink 5 Click** visit the official [product page](#).

How does it work?

USB-C Sink 5 Click is based on the STUSB4531QTR, a standalone USB Type-C and USB Power Delivery sink controller from STMicroelectronics designed for applications that need source-to-sink connection detection, power contract negotiation, VBUS monitoring, and input power path control. The STUSB4531QTR integrates a full USB PD stack, allowing it to autonomously negotiate a USB Power Delivery contract with a compatible source based on the default Power Data Object configuration stored in its internal non-volatile memory. Thanks to this Autorun mode, the device can establish high-power charging profiles without software support from the host system, making it suitable for automatic USB-C power input designs and battery-powered

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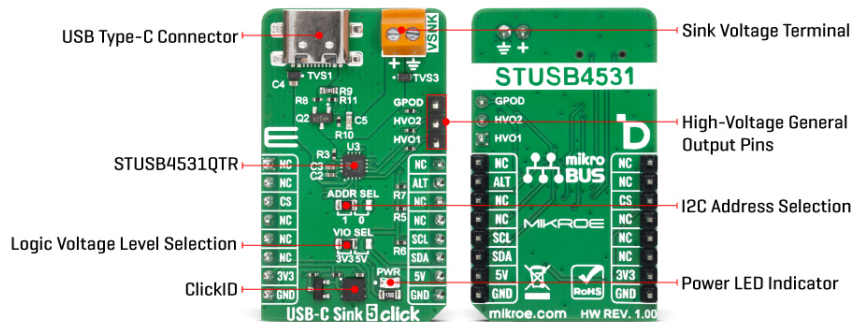


ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

systems that need operation even from a dead battery state. It can be used in set-top boxes, camcorders, cameras, gaming devices, displays, TVs, IoT equipment, drones, printers, 3D printers, computer accessories, data hubs, LED lighting, industrial systems, healthcare equipment, handheld devices, and battery-powered accessories.



The STUSB4531QTR variant used on this Click board supports dead battery mode, allowing battery/VBUS-powered applications to charge regardless of the current battery condition, which is useful in systems where the main controller may not yet be powered or initialized. The controller handles the complete Type-C attach and power negotiation process by detecting the connection between two ports, establishing a valid Source-to-Sink connection, determining the attached mode such as Sink or Debug Accessory Mode, resolving cable orientation and twist connections for proper USB data routing through mux control, negotiating a USB PD contract with a PD-capable source, configuring the power input path accordingly, and continuously monitoring VBUS while managing transitions and protection conditions.

USB-C Sink 5 Click communicates with the host MCU through an I2C interface and includes an ADDR SEL jumper for selecting the I2C slave address, with position 1 setting the address to 0x29 and position 0 setting it to 0x28. The board also features an active-low open-drain alert interrupt pin (ALT) for signaling relevant controller events to the host MCU, allowing the system to react to power negotiation, status, or fault-related conditions. In addition, USB-C Sink 5 Click includes a 3-pin header that provides access to high-voltage open-drain general-purpose outputs, including one general-purpose active-low high-voltage open-drain output and two additional active-low high-voltage open-drain general-purpose outputs, expanding the board's flexibility for external control, signaling, or system-level power management functions.

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	USB-C PD
Applications	Ideal for USB-C powered devices, battery-powered accessories, industrial systems, IoT equipment, handheld devices, and DC barrel or USB micro-B replacement applications

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On-board modules	STUSB4531QTR - standalone USB Power Delivery sink controller from STMicroelectronics
Key Features	Standalone USB Type-C and USB Power Delivery sink controller, autonomous USB PD contract negotiation, Autorun mode operation, default PDO configuration stored in internal non-volatile memory, dead battery mode support, source-to-sink connection detection, VBUS monitoring, input power path control, USB Type-C attach detection, Sink and Debug Accessory Mode detection, cable orientation and twist connection resolution, USB data routing mux control, and more
Interface	I2C
Feature	ClickID
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 USB-C Sink 5 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	NC	
	NC	2	RST	INT	15	ALT	Alert 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 Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	ADDR SEL	Right	I2C Address Selection 1/0: Left position 1, Right position 0

USB-C Sink 5 Click electrical specifications

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Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V

Software Support

[USB-C Sink 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 USB-C Sink 5 Click board for monitoring USB Type-C sink operation. The application reads VBUS and CC status registers, detects connection changes, and logs information about power availability, current capability, cable orientation, and device attachment.

Key Functions

- `usbcsink5_cfg_setup` This function initializes Click configuration structure to initial values.
- `usbcsink5_init` This function initializes all necessary pins and peripherals used for this Click board.
- `usbcsink5_read_info` This function reads device identification and revision information from the registers.
- `usbcsink5_write_reg_byte` This function writes one byte to the selected register using the block write function.
- `usbcsink5_read_reg_byte` This function reads one byte from the selected register using the block read function.

Application Init

Initializes the logger and USB-C Sink 5 Click driver, and reads device identification information.

Application Task

Continuously monitors VBUS and CC status registers, detects changes, and logs sink state, current level (default, 1.5A, 3.0A), cable orientation, and attachment status.

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.

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Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[USB-C Sink 5 Click example package](#)

[USB-C Sink 5 Click 2D and 3D files v100](#)

[USB-C Sink 5 Click schematic v100](#)

[STUSB4531QTR datasheet](#)

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