

Charger 31 Click



PID: MIKROE-6713

Charger 31 Click is a compact add-on board designed to provide intelligent charging for single-cell Li-ion or Li-polymer batteries in embedded applications. It is based on the [MP2724](#), a single-cell buck charger with USB Type-C sink mode from Monolithic Power Systems ([MPS](#)), which delivers a low-impedance power path to optimize charging efficiency, reduce charging time, and extend battery life. It features a narrow-voltage DC (NVDC) power management structure, configurable charge currents from 40mA to 2.2A via I2C, and a fully customizable JEITA profile with an additional NTC thermistor input for enhanced safety. Besides, there is also Power-Good and Charge Status LED indicators, a Battery MOSFET Reset button (MRST) for hardware power-on reset, Click Snap format, and a SYS terminal providing a regulated system output. Charger 31 Click is ideal for $\leq 15W$ USB-powered devices, Bluetooth headphones and speakers, point-of-sale terminals, and portable cameras.

For more information about **Charger 31 Click** visit the official [product page](#).

How does it work?

Charger 31 Click is based on the MP2724, a single-cell buck charger with USB Type-C sink mode from Monolithic Power Systems (MPS) designed to provide intelligent charging for single-cell Li-ion or Li-polymer batteries. This highly integrated 2.2A switch-mode battery management device features a narrow-voltage DC (NVDC) power management structure that delivers a low-impedance power path to optimize charging efficiency, reduce battery charging time, and extend battery life during discharging. It supports USB Type-C sink mode to detect the current capability of a connected USB Type-C adapter and offers an I2C interface for complete operating control, allowing users to configure charging parameters and monitor

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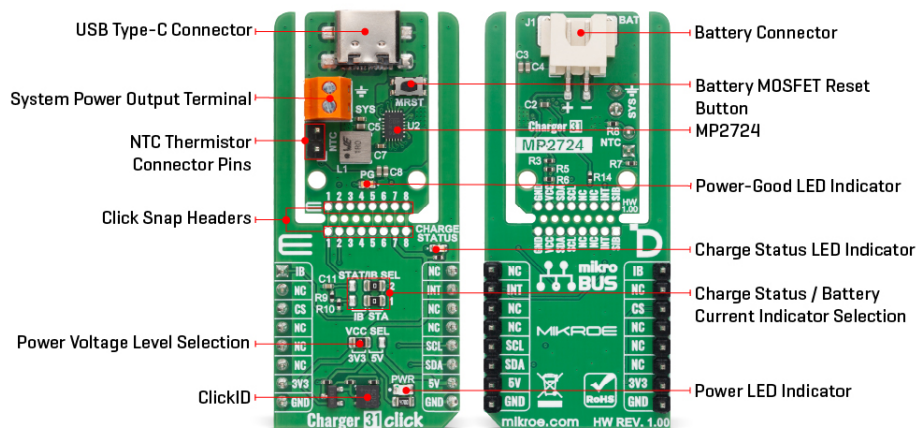


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status and interrupts. With its configurable parameters, multiple safety features, and versatile system integration options, Charger 31 Click is an ideal solution for applications such as $\leq 15W$ USB-powered devices, Bluetooth headphones and speakers, point-of-sale terminals, and portable cameras that require single-cell battery charging and management.



The MP2724 also supports a fully customizable JEITA profile with configurable temperature windows and actions, and an additional Negative Temperature Coefficient thermistor input (NTC header) for enhanced safety. It allows configurable charge currents from 40mA to 2.2A via the I2C interface and integrates a Power-Good red LED indicator and a Charge Status red LED indicator to provide clear visual feedback. The board features a Battery MOSFET Reset button (MRST) that enables a hardware power-on reset by toggling the internal FET status when the input source is absent, ensuring the system powered by the battery can be reset easily. The SYS terminal provides system power output from 3.7V to 3.94V, with a typical value of 3.82V, making it ideal for powering external circuits.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the MP2724 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Alongside the I2C communication pins, the board uses an INT pin for additional interrupt signaling and includes a set of jumpers labeled STAT/IB SEL for charge status or battery current indication selection. When both jumpers are in the STAT position, the board activates the charge status indication function, where the CHARGE STATUS LED glows red during charging and blinks when charging is suspended due to conditions such as battery overvoltage, input overvoltage, timer faults, or NTC faults. When the jumpers are in the IB position, the IB pin outputs a signal proportional to the battery's charge or discharge current, enabling precise current monitoring.

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.

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Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

Type	Battery charger
Applications	Ideal for ≤15W USB-powered devices, Bluetooth headphones and speakers, point-of-sale terminals, and portable cameras
On-board modules	MP2724 - single-cell buck-charger with USB type-C sink mode and 15mA termination current from MPS
Key Features	Narrow-voltage DC (NVDC) power management structure, configurable charge currents, a fully customizable JEITA profile with additional NTC thermistor input, USB Type-C sink mode for adapter current capability detection, Power-Good and Charge Status LED indicators, a Battery MOSFET Reset button, a SYS terminal providing regulated system output, Click Snap format, and more
Interface	I2C
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V, External

Pinout diagram

This table shows how the pinout on Charger 31 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Battery Current Monitor	IB	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	INT	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

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Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	PG	-	Power-Good LED Indicator
LD3	CHARGE STATUS	-	Charge Status LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V
T1	MRST	-	Battery MOSFET Reset Button

Charger 31 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
USB Input Voltage	-	5	-	V
System Output Voltage (SYS)	3.7	-	3.94	V
Charge Current	0.04	-	2.2	A

Software Support

[Charger 31 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 operation of the Charger 31 Click board by monitoring the status registers and displaying information related to power input, charging state, battery presence, and possible faults.

Key Functions

- `charger31_cfg_setup` This function initializes Click configuration structure to initial values.
- `charger31_init` This function initializes all necessary pins and peripherals used for this Click board.
- `charger31_default_cfg` This function executes a default configuration of Charger 31 Click board.
- `charger31_read_status` This function reads multiple status registers and stores the values into the provided status structure.

Application Init

Initializes the logger and the Click board, then performs the default configuration.

Application Task

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Periodically reads the status registers and logs messages for VIN readiness, battery presence, charging status, and charging faults.

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.

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Charger 31 click example package](#)

[Charger 31 click 2D and 3D files v100](#)

[MP2724 datasheet](#)

[Charger 31 click schematic v100](#)

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