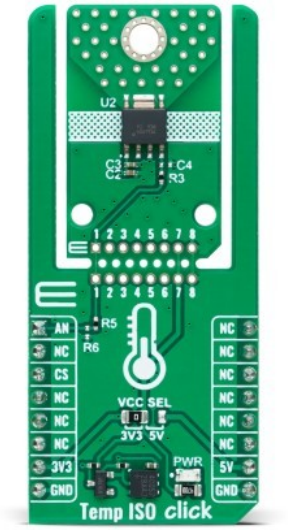
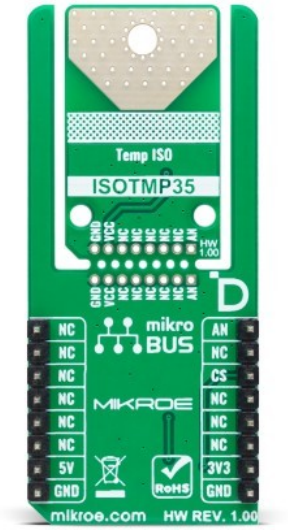
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Temp ISO Click





PID: MIKROE-6417

Temp ISO Click is a compact add-on board for accurate and isolated temperature measurements in high-voltage environments. This board features the ISOTMP35-Q1, an automotive-grade isolated temperature sensor with analog output from Texas Instruments. This sensor integrates a robust isolation barrier with a withstand voltage of up to 3000VRMS, a linear analog output with a 10mV/°C slope, and a wide temperature range of –40°C to 150°C. It delivers high accuracy of ±2.0°C, fast thermal response, and is AEC-Q100 qualified, ensuring long-term reliability in demanding conditions. The board also features Click Snap, enabling flexible sensor placement by detaching the PCB for standalone operation. Applications include HV battery management systems, high-voltage switching circuits, and thermal protection of power electronics, making it an essential tool for automotive and industrial systems requiring precise and reliable temperature monitoring.

How does it work?

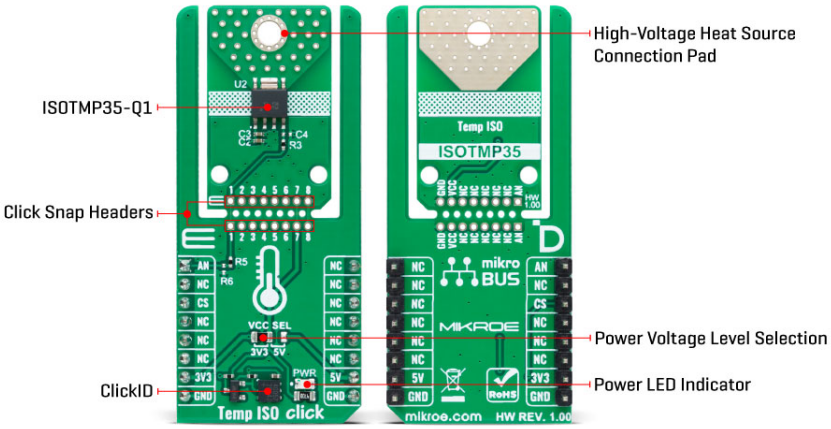
Temp ISO Click is based on the ISOTMP35-Q1, an automotive-grade isolated temperature sensor with analog output from Texas Instruments. This sensor is the first of its kind to integrate an isolation barrier with a withstand voltage of up to 3000VRMS, along with a temperature sensor that provides a linear analog output proportional to temperature, offering a slope of 10mV/°C across a wide range of –40°C to 150°C. This Click board™ can achieve precise, isolated temperature measurements while simplifying the design and reducing costs in high-voltage environments. It is an essential tool for applications such as HV battery management systems, high-voltage switching circuits, and thermal protection of power electronics.

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The ISOTMP35-Q1 enables accurate temperature measurements directly at high-voltage heat sources such as HV FETs, IGBTs, or contactors without requiring additional isolation circuitry. This design minimizes thermal lag, delivering faster and more precise thermal responses compared to traditional setups where the sensor must be placed farther from the heat source to meet isolation requirements. These capabilities make it ideal for applications in high-voltage environments and battery systems with stacked configurations for high voltage output.

This sensor features a robust UL 1577-compliant isolation barrier that ensures long-term reliability, supporting an isolation barrier life exceeding 50 years. It is also AEC-Q100 qualified, with HBM ESD classification level 2 and CDM ESD classification level C5, making it highly suitable for demanding automotive and industrial applications. The sensor delivers a maximum temperature accuracy of ±2.0°C and provides a rapid thermal response due to its optimized package design, which ensures excellent heat flow and minimizes thermal mass.

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 area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the ISOTMP35-Q1 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.

The ISOTMP35-Q1 outputs a linear analog voltage that is proportional to temperature, allowing easy integration with the host MCU through the AN pin of the mikroBUS™ socket. The high accuracy and fast response time of this Click board™ make it an excellent choice for monitoring high-voltage components, enabling improved safety in automotive and industrial systems.

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.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, introducing a new level of flexibility and ease of use. This feature allows for easy detachment of the main sensor

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area by simply snapping the PCB along designated lines, enabling various implementation possibilities. For detailed information about Click Snap, please visit the official page dedicated to this feature.

Specifications

Type	Isolators,Temperature & humidity
Applications	Ideal for applications such as HV battery management systems, high-voltage switching circuits, and thermal protection of power electronics
On-board modules	ISOTMP35-Q1 - automotive-grade isolated temperature sensor with analog output from Texas Instruments
Key Features	Automotive-grade isolated temperature sensor, integrated isolation barrier with high withstand voltage, linear analog output, wide temperature sensing range, high accuracy, UL 1577-compliant isolation barrier with a wide lifespan, fast thermal response and excellent heat flow, Click Snap, and more
Interface	Analog
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

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

Notes	Pin	mikroBUS				Pin	Notes
Analog Output	**AN**	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
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	Power Voltage Level Selection 3V3/5V: Left

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			position 3V3, Right position 5V

Temp ISO Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Temperature Range	-40	-	+150	°C
Temperature Accuracy	-	-	±2	°C
Withstand Isolation Voltage	-	-	3	kVRMS

Software Support

We provide a library for the Temp ISO 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 Temp ISO Click driver.

Key functions

- tempiso_read_temperature This function reads the voltage level from AN pin and converts it to temperature in degrees Celsius.
- tempiso_read_voltage_avg This function reads a desired number of ADC samples and calculates the average voltage level.
- tempiso_set_vref This function sets the voltage reference for Temp ISO click driver.

Example Description

This example demonstrates the use of Temp ISO Click by reading and displaying the temperature measurements.

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.TempISO

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

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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

Temp ISO Click example on Libstock

Temp ISO click 2D and 3D files v100

Temp ISO click schematic v100

ISOTMP35-Q1 datasheet

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