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Thermo 28 Click

PID: MIKROE-5466

Thermo 28 Click is a compact add-on board that accurately measures temperature. This board features the ams AG's AS6221, a high-accuracy digital temperature sensor. The AS6221 consists of a Si bandgap temperature factory-calibrated sensor, 16-bit ADC, and a digital signal processor, offering a high accuracy of ±0.09°C. It provides temperature data to the host controller through a compatible I2C interface, reliability, user-selectable I2C addresses, and alert functionality, which triggers an interrupt to protect the device from excessive temperatures. This Click board™ can be used in applications with high measurement accuracy, such as measuring the skin temperature and replacing PTC resistors in various consumer and environmental applications.

Thermo 28 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?

Thermo 28 Click is based on the AS6221, a digital temperature sensor from ams AG with increased reliability and improved accuracy specifications optimal for thermal management and protection applications. It integrates a digital temperature sensor with a SI bipolar transistor as a sensing element, a high-resolution analog-to-digital converter (ADC), a data processing circuit, and serial interface logic functions in one package. The voltage is digitized and converted to a 16-bit temperature result in degrees Celsius, giving a fully calibrated digital output with outstanding accuracy of up to ±0.09°C typical over a temperature range of 20°C to 42°C.

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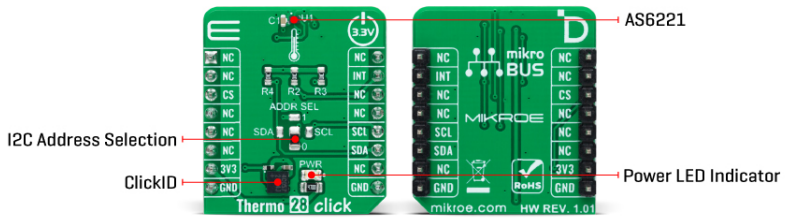

This Click board™ communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting a high clock frequency operation. It also allows the choice of the four least significant bits of its I2C slave address by positioning the SMD jumper labeled ADDR SEL to an appropriate position providing the user with a selection of four slave addresses. In addition to communication signals, the AS6221 also possesses an additional interrupt alert signal, routed on the INT pin of the mikroBUS™ socket, indicating when a specific interrupt event occurs that depends on the value of the temperature reading relative to programmable limits.

This Click board™ can only be operated from a 3.3V logic voltage level. Therefore, the board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Temperature & humidity
Applications	Can be used to replace PTC resistors in various consumer, and environmental applications
On-board modules	AS6221 - digital temperature sensor from ams AG
Key Features	Low power consumption, high precision, I2C interface, factory calibrated, high accuracy and resolution, high reliability and long-term stability, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

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This table shows how the pinout on Thermo 28 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	**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	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	ADDR SEL	Lower	I2C Address Selection: Left position SDA, Right position SCL, Upper position 1, Lower position 0

Thermo 28 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Temperature Accuracy	-	±0.09	-	°C
Resolution	-	16	-	bits

Software Support

We provide a library for the Thermo 28 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 Thermo 28 Click driver.

Key functions

- thermo28_get_temperature Thermo 28 get temperature function.
- thermo28_set_config Thermo 28 set configuration function.
- thermo28_set_continuous_conversion Thermo 28 set continuous conversion function.

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Example Description

This example demonstrates the use of Thermo 28 click board™ 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.Thermo28

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

Thermo 28 Click example on Libstock

AS6221 datasheet

Thermo 28 click 2D and 3D files v101

Thermo 28 click schematic v101