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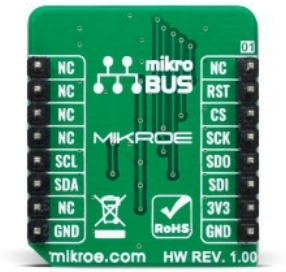
Barometer 6 Click



PID: MIKROE-4978

Barometer 6 Click is a compact add-on board used to measure air pressure in a specific environment. This board features the 2SMPB-02E, a high-accuracy digital barometric air pressure sensor with low current consumption from Omron Electronics. The 2SMPB-02E has a calibration parameter for broader pressure and temperature range, features a MEMS chip for sensing air pressure and an IC chip for signal processing. It converts pressure into a 24-bit digital value and sends the information via a configurable host interface that supports SPI and I2C serial communications. It measures pressure from 30kPa up to 110kPa with an accuracy of ±50Pa over a wide operating temperature range. This Click board™ is suited for various pressure-based applications, industrial, consumer, weather stations, and many more.

Barometer 6 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

Barometer 6 Click as its foundation uses the 2SMPB-02E, a high-accuracy digital barometric air pressure sensor from Omron Electronics, to measure air pressure in a specific environment. The sensor has a calibration parameter for broader pressure and temperature range. It measures pressure from 30kPa up to 110kPa with an accuracy of ±50Pa over a wide operating temperature range, ideally suited to the harsh environmental conditions prevalent in industrial and consumer applications.

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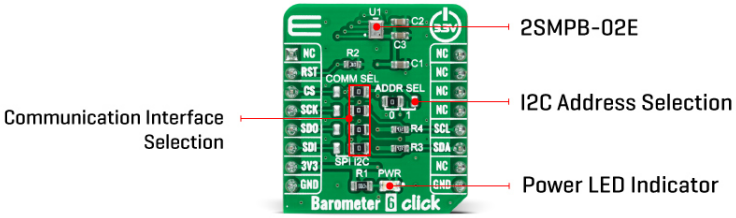

The 2SMPB-02E features a MEMS chip for sensing air pressure with high accuracy based on the built-in low noise 24-bit ADC. Individual calibration parameters are stored in One Time Programmable-ROM (OTP) and are retained when the system is powered down. An integrated temperature compensation circuit helps ensure accurate absolute pressure measurements.

Barometer 6 Click allows using both I2C and SPI interfaces with a maximum frequency of 3.4MHz for I2C and 10MHz for SPI communication. The selection can be made by positioning SMD jumpers labeled as COMM SEL to an appropriate position. Note that all the jumpers' positions must be on the same side, or the Click board™ may become unresponsive. While the I2C interface is selected, the 2SMPB-02E allows choosing the least significant bit (LSB) of its I2C slave address using the SMD jumper labeled ADDR SEL. This Click board™ also possesses an additional reset pin, routed to the RST pin on the mikroBUS™ socket used to implement the standard reset function.

This Click board™ can be operated only with a 3.3V logic voltage level. 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	Pressure
Applications	Can be used for various pressure-based applications, industrial, consumer, weather stations, and many more
On-board modules	2SMPB-02E - high-accuracy digital barometric air pressure sensor with low current consumption from Omron Electronics
Key Features	Low power consumption, high precision, measure barometric pressure and temperature with high accuracy, selectable interface, and more
Interface	I2C,SPI
ClickID	No
Compatibility	mikroBUS™

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Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Barometer 6 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	
Reset	**RST**	2	RST	INT	15	NC	
SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	**SCL**	I2C Clock
SPI Data IN	**SDI**	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-JP4	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP5	COMM SEL	Right	I2C Address Selection 0/1: Left position 0, Right position 1

Barometer 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Pressure Range	30	-	110	kPa
Accuracy	-	±50	-	Pa
Resolution	-	24	-	bits
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Barometer 6 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

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Library Description

This library contains API for Barometer 6 Click driver.

Key functions

- barometer6_hardware_reset Barometer 6 hardware reset function.
- barometer6_set_mode Barometer 6 set operation mode function.
- barometer6_read_temperature_value Barometer 6 get temperature value function.

Example Description

This is an example that demonstrates the use of the Barometer 6 Click board™.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Barometer6

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 MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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™

Downloads

2SMPB-02E datasheet

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[Barometer 6 click 2D and 3D files]

[Barometer 6 click schematic]

[Barometer 6 click example on Libstock]

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