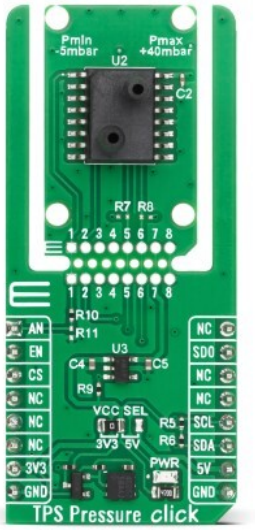
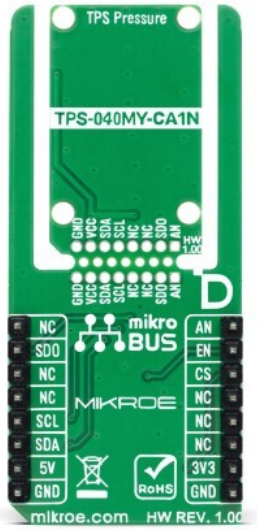
MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

TPS Pressure Click - 040MY





PID: MIKROE-6824

TPS Pressure Click - 040MY is a compact add-on board for gage and differential pressure sensing in medical, industrial, and environmental monitoring systems. It is based on the TPS-040MY-CA1N-00-T low-pressure MEMS sensor from TE Connectivity, which integrates a silicon micromachined pressure transducer with CMOS mixed-signal processing for fully conditioned and temperature-compensated outputs. This board supports both analog output and digital communication through I2C/I3C interfaces, operates over a pressure range from –5 mbar to +40 mbar with a total error band of ±1% full scale, and features a dual vertical port SOIC-16 package for reliable reference measurements. Additional functionality such as SDO status monitoring, an enable-controlled power path, and Click Snap format further enhance flexibility and system integration. TPS Pressure Click - 040MY is well suited for CPAP and sleep apnea devices, ventilators, gas and air flow instrumentation, and HVAC or VAV applications where low-pressure monitoring is essential.

For more information about **TPS Pressure Click - 040MY** visit the official product page.

How does it work?

TPS Pressure Click - 040MY is based on the TPS-040MY-CA1N-00-T, a low-pressure MEMS sensor from TE Connectivity designed for gage and differential pressure sensing in medical, industrial, and environmental monitoring applications. The sensor combines advanced silicon micromachined pressure transducer technology with CMOS mixed-signal processing to deliver fully conditioned, multi-order pressure and temperature-compensated output data. The sensor supports both analog (AN pin) and digital communication, including I2C and I3C interfaces, allowing flexible integration with a wide range of microcontrollers and simplifying system design by eliminating the need for external signal conditioning. This sensor is well suited for

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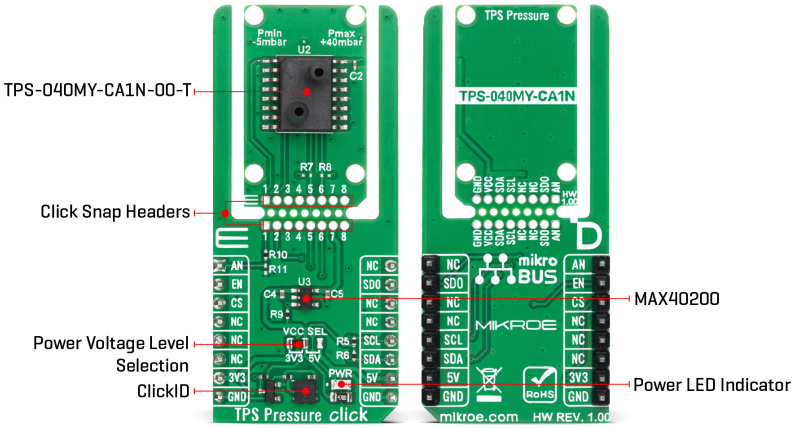

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the TPS-040MY-CA1N-00-T 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.

Housed in a JEDEC-standard SOIC-16 package with a dual vertical porting option, the TPS-040MY-CA1N-00-T enables true reference measurements, helping to minimize errors caused by ambient pressure variations. It operates over a pressure range from –5 mbar up to +40 mbar and achieves a total pressure error band of ±1% full scale for both digital and analog outputs, ensuring high accuracy and repeatability. In addition to the interface pins, the board also use the SDO pin, which provides direct insight into the internal operation of the TPS Low Pressure Sensor.

The serial data output (SDO) pin is used to monitor the status of the sensor’s digital core and to transmit the measurement results requested through issued commands, enabling transparent communication between the sensor and the host system. Through this pin, the internal behavior of the device can be observed at any time, which is particularly useful for diagnostics, debugging, and system validation during development and operation. To optimize power control and operational management, TPS Pressure Click - 040MY integrates the MAX40200 ideal diode controller from Analog Devices, which enables or disables the TPS-040MY-CA1N-00-T through a dedicated enable pin (EN), providing efficient power switching and protection.

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, designed to bring

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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	Pressure
Applications	Ideal for CPAP and sleep apnea devices, ventilators, gas and air flow instrumentation, and HVAC or VAV applications
On-board modules	TPS-040MY-CA1N-00-T - gage and differential pressure sensor from TE Connectivity
Key Features	Low-pressure gage and differential sensing, fully conditioned and temperature-compensated output, analog output and digital communication, total pressure error band of ±1% full scale, digital core status monitoring and data output, Click Snap support, and more
Interface	I2C,I3C
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 TPS Pressure Click - 040MY 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	
Device Enable	**EN**	2	RST	INT	15	**SDO**	Serial Data Output
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	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

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TPS Pressure Click - 040MY electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Pressure Range	-5	-	+40	mbar

Software Support

TPS Pressure 040MY 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 TPS Pressure 040MY Click board. The application continuously measures and logs the pressure in millibars and the temperature in degrees Celsius.

Key Functions

- tpspressure040my_cfg_setup This function initializes Click configuration structure to initial values.
- tpspressure040my_init This function initializes all necessary pins and peripherals used for this Click board.
- tpspressure040my_default_cfg This function executes a default configuration of TPS Pressure 040MY Click board.
- tpspressure040my_read_data This function reads pressure (mBar) and temperature (degC) values.

Application Init

Initializes the driver, checks communication, and applies the default configuration.

Application Task

Reads and logs pressure and temperature values every 100 ms.

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

TPS Pressure click - 040MY 2D and 3D files v100

TPS Pressure click - 040MY schematic v100

TPS Pressure click - 040MY example package

TPS-040MY-CA1N-00-T datasheet