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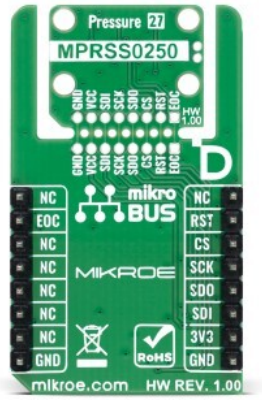
Pressure 27 Click



PID: MIKROE-6956

Pressure 27 Click is a compact add-on board designed for monitoring of pressure levels in applications requiring stable digital output and low-pressure sensing. It is based on the MPRSS0250KA00000C, a 250kPa MPR absolute pressure sensor from Honeywell. This sensor features a miniature piezoresistive silicon sensing element with factory-calibrated and temperature-compensated digital output, supported by an integrated ASIC that corrects offset, sensitivity, temperature effects, and non-linearity for consistent performance. It communicates via a 4-wire SPI interface and also includes pins for complete sensor reset and end-of-conversion monitoring, as well as optional anti-aliasing filter implementation to improve signal quality in noise-sensitive environments. It is well suited for medical devices, commercial appliances, industrial equipment, and HVAC systems that require dependable absolute pressure sensing.

For more information about **Pressure 27 Click** visit the official product page.

How does it work?

Pressure 27 Click is based on the MPRSS0250KA00000C, a 250kPa MPR absolute pressure sensor from Honeywell, built around a miniature piezoresistive silicon sensing element with a digital output for precise pressure reading across its specified full-scale pressure span and operating temperature range. As part of Honeywell's MPR Series, this sensor is factory calibrated and compensated through an integrated Application Specific Integrated Circuit (ASIC), which corrects sensor offset, sensitivity, temperature influence, and non-linearity to ensure stable and reliable performance. The MPRSS0250KA00000C features a short port configuration, uses a built-in vacuum reference for absolute pressure measurement, and incorporates silicone gel protection, making it suitable for low-pressure sensing tasks in higher-

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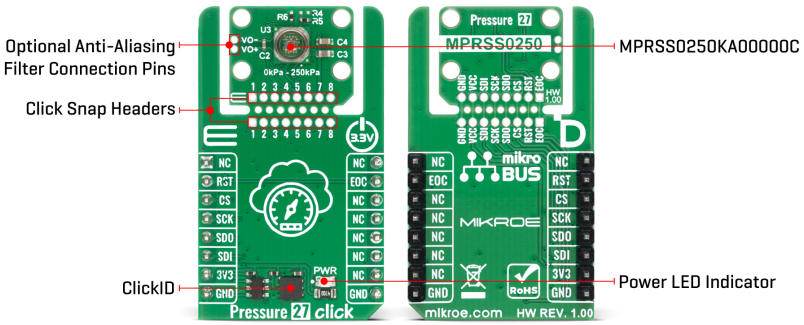
volume medical devices, both consumer and non-consumer, as well as commercial appliance, industrial, and HVAC applications.



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 MPRSS0250KA00000C 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 MPRSS0250KA00000C communicates with the host MCU through a 4-wire SPI interface, enabling fast digital data transfer. In addition to the standard SPI communication lines, the board also uses the RST pin for a complete sensor reset, allowing the device to be reinitialized when needed, while the EOC pin serves as an end-of-conversion indicator, signaling that the measurement and internal calculation cycle have been completed and that the pressure data is ready to be clocked out. Furthermore, within the Snap section of the board, the VO- and VO+ pins are exposed for an optional anti-aliasing filter connection, which can be used to suppress unwanted high-frequency noise components before signal processing, improving measurement integrity and helping ensure cleaner and more stable pressure acquisition in noise-sensitive systems.

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. It also comes equipped with a library containing functions and 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 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

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Type	Pressure
Applications	Ideal for medical devices, commercial appliances, industrial equipment, and HVAC systems that require dependable absolute pressure sensing
On-board modules	MPRSS0250KA00000C - 250kPa MPR absolute pressure sensor from Honeywell
Key Features	250kPa absolute pressure sensing, factory-calibrated and temperature-compensated operation, integrated ASIC for offset, sensitivity, temperature, and non-linearity correction, short port configuration, built-in vacuum reference for absolute pressure measurement, silicone gel protection, 4-wire SPI interface, Click Snap format, and more
Interface	SPI
Feature	Click Snap,ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Pressure 27 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 / ID SEL	**RST**	2	RST	INT	15	**EOC**	End-Of-Conversion Indicator
SPI Select / ID COMM	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**SDI**	6	MOSI	SDA	11	NC	
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

Pressure 27 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Pressure Range	0	-	250	kPa

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Software Support

Pressure 27 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 Pressure 27 Click board for measuring pressure. The application reads sensor values via the SPI interface and displays the measured results on the serial terminal.

Key Functions

- pressure27_cfg_setup This function initializes Click configuration structure to initial values.
- pressure27_init This function initializes all necessary pins and peripherals used for this Click board.
- pressure27_hw_reset This function performs a hardware reset of the sensor by driving the RES pin low for 1 ms, then high again.
- pressure27_get_eoc This function reads the current logic level of the EOC pin.
- pressure27_get_pressure This function performs a pressure measurement, reads the 24-bit result, and converts raw counts to pressure in kPa.

Application Init

Initializes the logger and the Pressure 27 Click driver.

Application Task

Periodically reads pressure values from the sensor and logs the results to the serial terminal.

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

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Pressure 27 click example package

Pressure 27 click 2D and 3D files v100

Pressure 27 click schematic v100

MPRSS0250KA00000C datasheet