

Vibra Sense 2 Click



PID: MIKROE-4355

Vibra Sense 2 Click is a compact add-on board that contains a piezo sensor suitable for vibration measurements. This board features the LDT0-028K, a flexible 28 μm thick piezoelectric PVDF polymer film with screen-printed silver ink electrodes, laminated to a 0.125 mm polyester substrate, and fitted with two crimped contacts from TE Connectivity. The sensing element of the LDT0-028K comprises a cantilever beam loaded by an additional mass to offer high sensitivity at low frequencies. Some features of this Click board™ like flexibility, high sensitivity, and performance make it an excellent choice for vibrating sensing applications, security systems, body movement, and many more.

Vibra Sense 2 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?

Vibra Sense 2 Click is based on the LDT0-028K, a flexible 28 μm thick piezoelectric PVDF polymer film with screen-printed silver ink electrodes, laminated to a 0.125 mm polyester substrate, and fitted with two crimped contacts from TE Connectivity. This piezo sensor comes with solderable crimp pins often used for flex, touch, vibration, and shock measurements. When the sensor moves back and forth, a small AC and large voltage will be created by the voltage comparator inside of it. Although, it has a high receptivity for strong impacts with a wide dynamic range that also guarantees excellent measuring performance.

Mikroe produces entire development toolchains for all major microcontroller architectures.

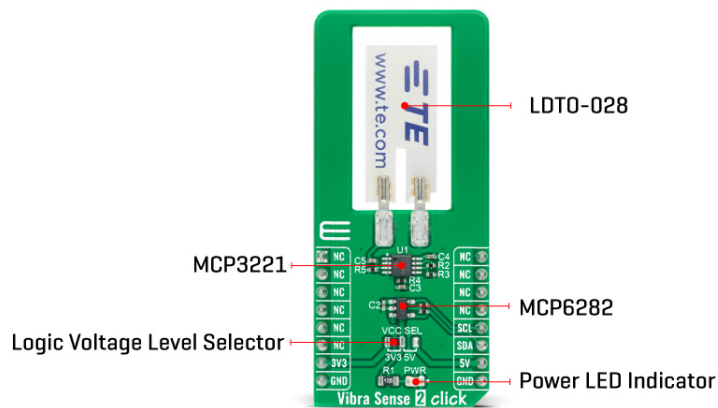
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



The LDTM-028K is a vibration sensor where the sensing element comprises a cantilever beam loaded by an additional mass to offer high sensitivity at low frequencies. A charge amplifier detects the output signal as vibration and sends it on the single-ended analog input pin of the ADC. Using a charge amplifier allows a very long measurement time constant and thus allows the "open-circuit" voltage response to be calculated). To bring the corresponding signal to the ADC pin, this Click board™ uses an analog circuitry made of OpAmp [MCP6282](#) from [Microchip](#) that has a function of a buffer.

Vibra Sense 2 Click communicates with MCU through the [MCP3221](#), a successive approximation A/D converter with a 12-bit resolution from [Microchip](#), using a 2-wire I2C compatible interface. This device provides one single-ended input with very low-power consumption, a low maximum conversion current, and a Standby current of 250 µA and 1 µA, respectively. Data on the I2C bus can be transferred at rates of up to 100 kbit/s in the Standard Mode, and up to 400 kbit/s in the Fast Mode. Also, maximum sample rates of 22.3 kSPS with the MCP3221 are possible in a Continuous-Conversion Mode with a clock rate of 400 kHz.

This Click board™ is designed to be operated with both 3.3V and 5V logic voltage levels that can be selected via VCC SEL jumper. This allows for both 3.3V and 5V capable MCUs to use the I2C communication lines properly. However, the Click board™ comes equipped with a library that contains easy to use functions and an example code that can be used as a reference for further development.

Specifications

Type	Force
Applications	Can be used for vibrating sensing applications, security systems, body movement, and many more.
On-board modules	Vibra Sense 2 Click is based on the LDT0-028K, a flexible 28 µm thick piezoelectric PVDF polymer film with screen-printed silver ink electrodes, laminated to a 0.125 mm polyester substrate, and fitted with two crimped contacts from TE Connectivity.
Key Features	Low power consumption, high sensitivity, excellent measuring performance, high

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.




ISO 9001: 2015 certification of quality management system (QMS).

	receptivity for strong impacts with a wide dynamic range, and more.
Interface	I2C
Feature	No 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 Vibra Sense 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
	NC	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

Vibra Sense 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-0.3	-	6	V
Sensing Range	0	-	180	Hz
Sensitivity	50	-	800	mV/g
Maximum Sample Rate	-	-	22.3	kSPS
Operating Temperature Range	0	-	+85	°C

Software Support

We provide a library for the Vibra Sense 2 Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Library Description

The library covers all the necessary functions that enables the usage of the Vibra Sense 2 Click board™. It offers reading from output register, calculations that result in relatively accurate measurement of output voltage and the vibration level of the piezo element.

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

Key functions:

- `uint16_t vibrasense2_read_data ();` - Function is used to read raw data from MCP3221.
- `uint16_t vibrasense2_read_voltage (uint16_t v_ref);` - Function is used to calculate piezo voltage in millivolts.
- `int8_t vibrasense2_vibration_level ();` - Function is used to get vibration level.

Examples description

The application is composed of three sections :

- System Initialization - Initializes I2C module and LOG structure.
- Application Initialization - Initializes I2C driver and makes an initial log.
- Application Task - Demonstrates use of Vibra Sense 2 Click board™ by checking vibration levels and displaying changes via USART terminal.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- I2C
- UART

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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

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

[Vibra Sense 2 click 2D and 3D files](#)

[Vibra Sense 2 click example on Libstock](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

[MCP3221 datasheet](#)

[MCP6282 datasheet](#)

[Vibra Sense 2 click schematic](#)

[LDT0-028K datasheet](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Mikroe:](#)

[MIKROE-4355](#)