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Mic Click

PID: MIKROE-2563

Mic Click is a compact add-on board equipped with a microphone accompanied by a suitable amplifier. This board features the SPQ0410HR5H-B, a slim ultra-mini SiSonic™ microphone specification with Maximum RF protection and ultra-narrow design from Knowles. The microphone has an omnidirectional directivity, ultra-stable performance, and works in a 100Hz to 10KHz frequency range. It features MaxRF protection that prevents RF noise in traces from getting into the mic output. This Click board™ makes the perfect solution for the development of cell phones, smartphones, laptop computers, sensors, digital still cameras, portable music recorders, and other portable electronic devices where excellent wideband audio performance and RF immunity are required.

Mic 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?

Mic Click is based on the SPQ0410HRSH-B, a slim ultra-mini SiSonic™ microphone specification with maximum RF protection and ultra-narrow design from Knowles. It is a MEMS microphone and consists of an acoustic sensor, a low noise input buffer, and an output amplifier. It is a very reliable microphone, resistant to mechanical shocks, vibrations, thermal shocks, low and high temperatures, ESD-HBM, and more. It is not resistant to high pressure and vacuum. The microphone is top-port oriented and has a typical sensitivity of -42dB at 94dB SPL, with a 59dB signal-to-noise ratio.

Mic Click uses an analog OUT pin of the mikroBUS™ socket to communicate with the host MCU.

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The analog output from the microphone to the OUT pin goes through the MCP6022, a rail-to-rail input/output 10MHz Op Amp from Microchip. This operational amplifier has a wide bandwidth, low noise, low input offset voltage, and low distortion and amplifies the microphone's output with high performance.

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. Also, it comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Microphone
Applications	Can be used for the development of cell phones, smartphones, laptop computers, sensors, digital still cameras, portable music recorders, and other portable electronic devices where excellent wideband audio performance and RF immunity are required
On-board modules	SPQ0410HRSH-B - slim ultra-mini SiSonic™ microphone specification with maximum RF protection and ultra-narrow design from Knowles
Key Features	Extremely narrow package, low current, MaxRF protection, ultra-stable performance, omnidirectional, SiSonicTM MEMS technology, top port silicone microphone, and more
Interface	Analog
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Mic Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS™				Pin	Notes
Analog Output	**OUT**	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	NC	
	NC	6	MOSI	SDA	11	NC	
Power Supply	**3.3V**	7	3.3V	5V	10	NC	

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Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
-	PWR	-	Power LED Indicator

Mic Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Frequency Range	100	-	100000	Hz
Sensitivity	-45	-42	-39	dBV/Pa
Signal-to-Noise Ratio	-	59	-	dB
Output Impedance	-	-	400	Ω

Software Support

We provide a library for the Mic 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 Mic Click driver.

Key functions

- This function read ADC data.

Example Description

This example showcases the initialization and configuration of the Click and logger modules and later on reads and displays data recorded by the mic.

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.Mic

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.

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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™

Click board™ Catalog

Click Boards™

Downloads

Mic click example on Libstock

SPQ0410HR5H-B datasheet

Mic click schematic