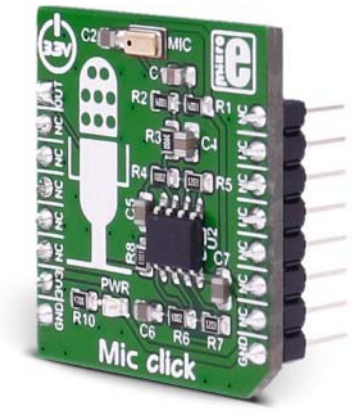
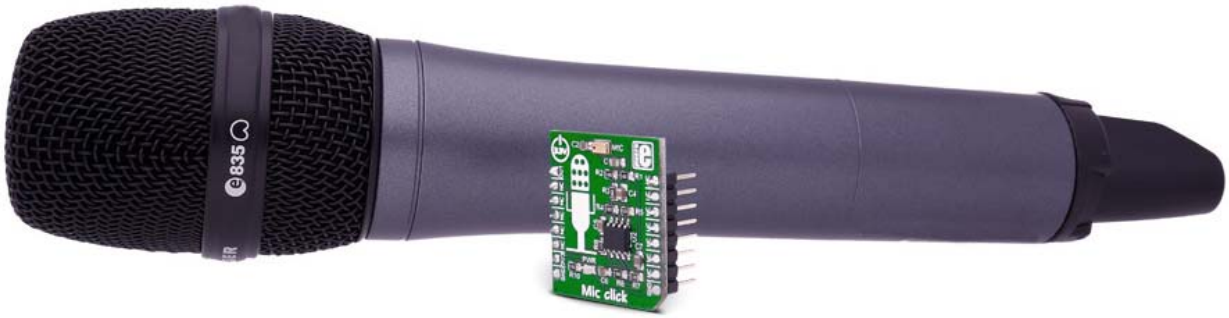
Mic click

PID: MIKROE-2563



Mic click carries the SPQ0410HR5H-B surface mount silicon microphone with maximum RF protection. The click is designed to run on a 3.3V power supply. It communicates with the target microcontroller over the AN pin on the mikroBUS™ line.



How it works

Mic clicks contains a silicon microphone, which outputs the signal to the analog pin (AN) on the mikroBUS™ line via the op amp.

SPQ0410HR5H-B features

The SPQ0410HR5H-B is a miniature, high-performance, low power, top port silicon microphone.

Using the SiSonic™ MEMS technology, the SPQ0410HR5H-B consists of an acoustic sensor, a low noise input buffer, and an output amplifier.

MaxRF protection prevents RF noise in traces from getting into the mic output.

TEST CONDITIONS: 23 ±2°C, 55±20% R.H., V_{DD}(min) < V_{DD} < V_{DD}(max), no load, unless otherwise indicated

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage[1]	V_{DD}		1.5	-	3.6	V
Supply Current[1,2]	I_{DD}		-	120	160	µA
Sensitivity[1]	S	94 dB SPL @ 1 kHz	-45	-42	-39	dBV/Pa
Signal to Noise Ratio	SNR	94 dB SPL @ 1 kHz, A-weighted	-	59	-	dB(A)
Total Harmonic Distortion	THD	94 dB SPL @ 1 kHz, S = Typ, R_{load} > 3 kΩ	-	-	1	%
Acoustic Overload Point	AOP	10% THD @ 1 kHz, S = Typ, V_{DD} = 3.6V, R_{load} > 3 kΩ	115	-	-	dB SPL
DC Output		V_{DD} = 1.5V	-	0.73	-	V
Output Impedance	Z_{OUT}	@ 1 kHz	-	-	400	Ω
Directivity			Omnidirectional			
Polarity		Increasing sound pressure	Decreasing output voltage			

[1] 100% tested.

[2] Maximum specifications are measured at maximum V_{DD}. Typical specifications are measured at V_{DD} = 1.8V.

Omnidirectional microphones

SPQ0410HR5H-B is an **omnidirectional microphone**. As the name implies an omnidirectional microphone can hear equally in all directions. So whichever way you hold it, up or down, it will work the same.

Key features

- SPQ0410HR5H-B
  - Sensitivity: -42 dBV/Pa
  - Signal to noise ratio: 59 dB (A)
  - Output impedance: 400 Ω
  - Omnidirectional
  - MaxRF protection
- Interface: AN pin
- 3.3V power supply

Specification

Product Type	Microphone
Applications	Processing audio with an MCU, mobile phones, smartphones, laptop computers, sensors, digital still cameras, portable music recorders, etc.
MCU	SPQ0410HR5H-B
Key Features	Omnidirectional, MaxRF protection, Sensitivity: -42 dBV/Pa
Interface	Analog
Power Supply	3.3V
Compatibility	mikroBUS
Click board size	S (28.6 x 25.4 mm)

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 pin	**AN**	**1**	AN	PWM	**16**	NC	Not connected
Not connected	NC	**2**	RST	INT	**15**	NC	Not connected
Not connected	NC	**3**	CS	TX	**14**	NC	Not connected
Not connected	NC	**4**	SCK	RX	**13**	NC	Not connected
Not connected	NC	**5**	MISO	SCL	**12**	NC	Not connected
Not connected	NC	**6**	MOSI	SDA	**11**	NC	Not connected
Power supply	**+3.3V**	**7**	3.3V	5V	**10**	NC	Not connected
Ground	**GND**	**8**	GND	GND	**9**	**GND**	Ground

Programming

Code examples for Mic click, written for MikroElektronika hardware and compilers are available on Libstock.

Code snippet

The following code snippet measures volume every 10 ms, and outputs measured data to a tft display.

```
01 void main()
02 {
03    uint16_t measuredValue;
04
05    systemInit ();
06    TFT_Set_Pen( CL_RED, 1 );
07    while (1)
08    {
09        measuredValue = ADC1_Read(12);
10        y = measuredValue/30 + 71;
11        if (x !=0)
12            TFT_Line (x, y, oldx, oldy);
13
14        oldx = x;
15        oldy = y;
16
17        Delay_ms (10);
18        x++;
19        if (x==320)
20        {
21            x=0;
22            TFT_Set_Pen( CL_WHITE, 1 );
23            TFT_Rectangle (0,71,320,219);
24            TFT_Set_Pen( CL_RED, 1 );
25        }
26    }
27 }
```