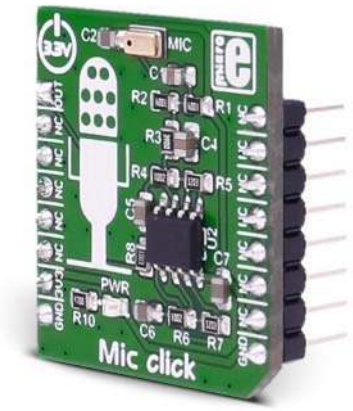
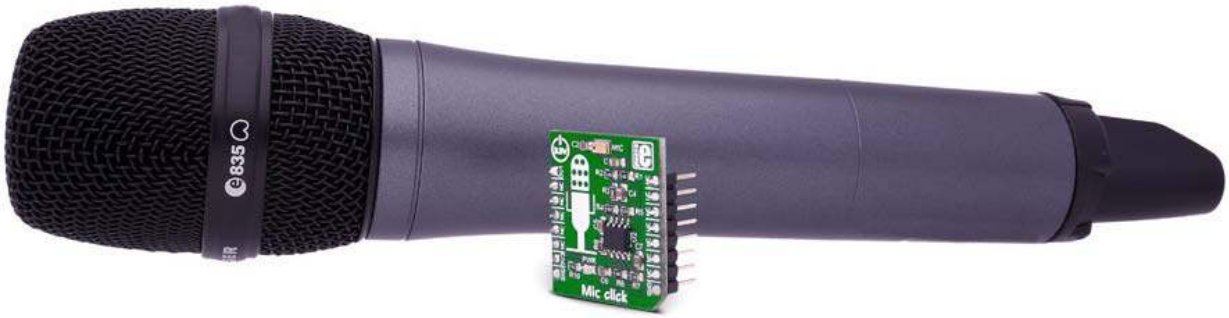
# Mic click

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 }
```