



VIBRO MOTOR 2 CLICK

PID: MIKROE-3713

Weight: 19 g

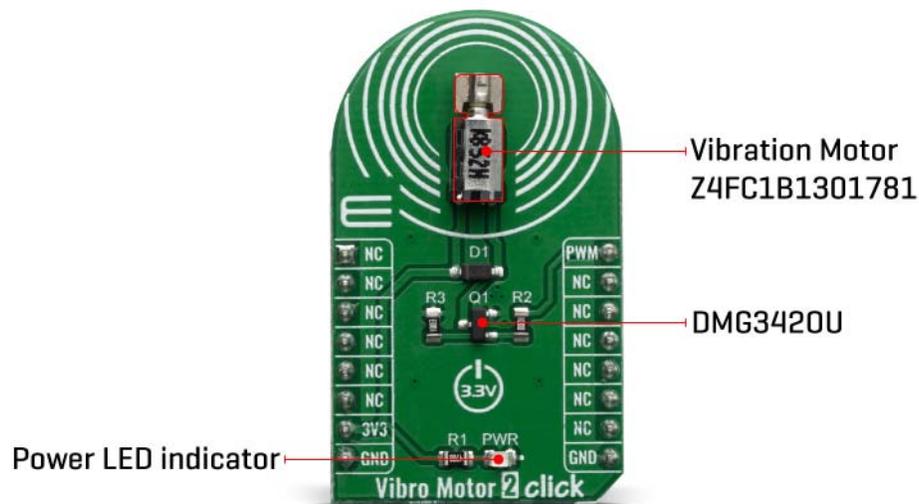
Vibro Motor 2 Click features a compact size Eccentric Rotating Mass (ERM) motor, labeled as Z4FC1B1301781 as well as DMG3420U MOSFET to drive the ERM motor, since the MCU itself cannot provide enough power for the motor driving. This type of motor is often used for haptic feedback on many small handheld devices, such as the cellphones, pagers, RFID scanners and similar devices. This motor contains a small eccentric weight on its rotor, so while rotating it also produces vibration effect. This kind of motors is sometimes referred to as coin motors, due to its shape.

Besides the vibration motor, the click is also equipped with the DMG3420U, a small MOSFET, which is used to drive the motor. The Vibro Motor 2 click is an ideal solution for adding a simple, one pin driven haptic feedback on any design.

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HOW DOES IT WORK?

Vibro Motor 2 click features a compact size Eccentric Rotating Mass (ERM) motor, labeled as Z4FC1B1301781. The click uses the DMG3420U MOSFET to drive the ERM motor, since the MCU itself cannot provide enough power for the motor driving. The circuit also contains a protection diode, which is used to protect the transistor from the reverse voltage, since the motor represents an inductive load and turning off its current can produce a kickback voltage that can damage the transistor.



The gate of the MOSFET is driven by the PWM signal, routed through the PWM pin of the mikroBUS™. The PWM signal toggles the gate of the MOSFET with the pulses of a certain width. As a result, the current through the motor is varied depending on the pulse width of the PWM signal, which directly affects the speed of the motor, effectively controlling the vibration force that way. The small, eccentric weight attached to the rotor of the coin motor, generates the centrifugal force while it rotates, which in turn results with the wobbling effect of the motor itself. The faster the rotation is, the bigger the force gets. Controlling the motor speed allows for the vibration intensity to be controlled.

MikroElektronika library contains functions that are used to easily drive the motor by changing the PWM pulse width, saving time for the application firmware development.

SPECIFICATIONS

Type	Haptic
Applications	An ideal solution for adding a simple, one pin driven haptic feedback on any design.
On-board modules	Z4FC1B1301781, cylindrical core SMT Motor from Jinlong Machinery & Electronics
Key Features	Low power consumption, compact size
Interface	PWM
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

PINOUT DIAGRAM

This table shows how the pinout on Vibro Motor 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	PWM	Motor speed control
	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	
Ground	GND	8	GND	GND	9	GND	Ground

ONBOARD SETTINGS AND INDICATORS

Label	Name	Default	Description
M1	Vibro motor	-	Vibration motor
PWR	Power LED	-	Power LED indicator

VIBRO MOTOR 2 CLICK ELECTRICAL SPECIFICATIONS

Description	Min	Typ	Max	Unit
Rated ERM motor speed	7500	10000	12500	RPM
Mechanical noise			50	dB
Operating Temperature	-20		+70	°C

SOFTWARE SUPPORT

We provide a library for the Vibro Motor 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

This library helps user to define the all necessary GPIOs to control vibro motor. For Vibro Motor 2 Click board user only needs PWM pin on MIKROBUS. For more details check documentation.

Key functions:

- `void vm2_gpioDriverInit(T_VM2_P gpioObj);` - This function initializes GPIO driver.

Examples description

The application is composed of three sections :

- System Initialization - Initializes peripherals and pins.
- Application Initialization - Initializes GPIO driver and PWM. Configures PWM to 20kHz frequency, calculates maximum duty ratio and starts PWM with duty ratio value 0.
- Application Task - (code snippet) - Allows user to enter desired command to control Vibro Motor 2 Click board. The command can be entered from the serial port. The possible commands are :
 - characters from '1' to '9' to set duty ratio step (step = character * 5)
 - character '0' to set duty ratio step on value 100
 - character '+' to increment current duty ratio by selected step
 - character '-' to decrement current duty ratio by selected step
 - characters 'e' and 'E' to start Vibro Motor 2
 - characters 'd' and 'D' to stop Vibro Motor 2
 - characters 's' and 'S' to check Vibro Motor 2 (PWM) status

```
void applicationTask()
{
    rx_dat = UART_Rdy_Ptr();

    if (rx_dat != _RX_NOT_READY)
    {
        rx_dat = UART_Rd_Ptr();

        checkRx();
    }
}
```

Additional Functions :

- checkRx - Executes the command (entered by user) processing.

The full application code, and ready to use projects can be found on our LibStock page.

Other mikroE Libraries used in the example:

- Conversions
- C_String
- PWM
- 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.



<https://www.mikroe.com/vibro-motor-2-click/8-29-19>