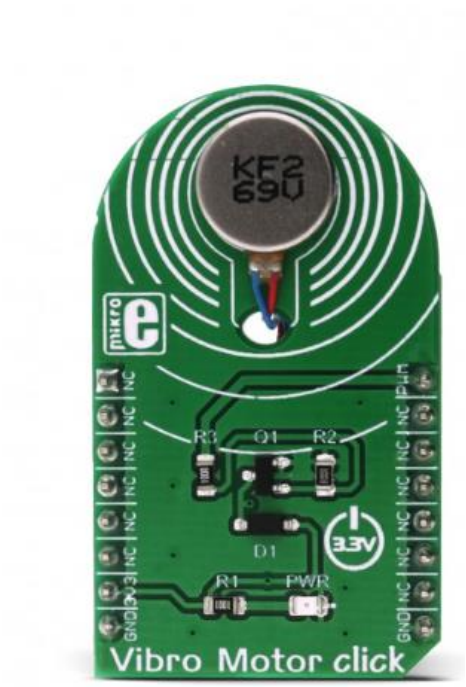
Vibro Motor click

PID: MIKROE-2826

Vibro Motor click features a compact size Eccentric Rotating Mass (ERM) motor, labeled as C1026B002F. 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 click is an ideal solution for adding a simple, one pin driven haptic feedback on any design.

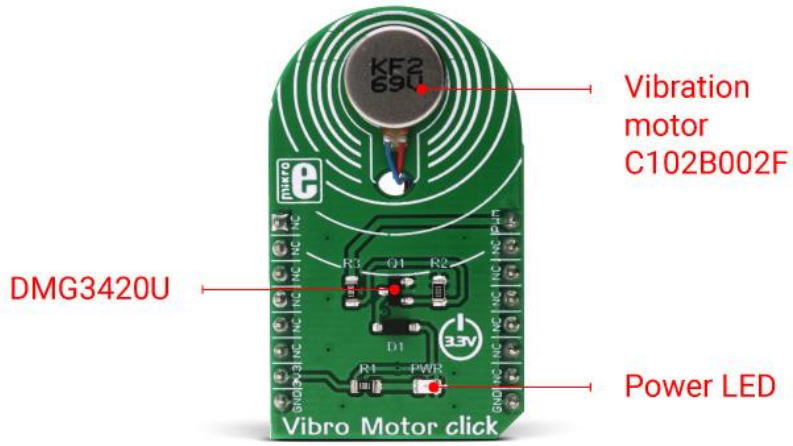
How does it work?

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	DC
Applications	An ideal solution for adding a simple, one pin driven haptic feedback on any design.
Key Features	Low power consumption, compact size
Interface	PWM
Input Voltage	3.3V
Click board size	M (42.9 x 25.4 mm)

Pinout diagram

This table shows how the pinout on **Vibro Motor click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle Columns).

Notes	Pin	mikroBUS				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	3V3	7	3.3V	5V	10	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Vibro Motor click specifications

Description	Min	Typ	Max	Unit
Rated ERM motor speed	9000			RPM
Bracket deflection strength		9.8		N
Mechanical noise			50	dB
Operating Temperature	-20		+60	°C

Onboard settings and indicators

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