Coin flat vibration Motors disks

Coin flat vibration disks are **tiny vibrating motors** commonly used in electronics projects and consumer devices where compact vibration feedback is needed. They are also called **coin vibration motors**, **flat pager motors**, or simply **vibration disks**.

Key Features:

- Shape & Size: Flat, coin-shaped (often 8–12 mm diameter, ~3–5 mm thick).
- Operation Voltage: Typically, 2–5 V DC (3 V is common).
- Current Draw: Around 60–100 mA depending on model.
- Output: Produces vibration by spinning an eccentric rotating mass (ERM) inside the flat casing.
- Mounting: Often comes with double-sided adhesive backing for easy placement.
- Wiring: Two solder pads or pre-attached flexible wires.

Common Applications:

- Mobile phones & pagers (haptic feedback).
- Wearable devices (watches, fitness trackers).
- DIY electronics (Arduino/ESP projects).
- Toys and novelty gadgets.
- Silent vibration alerts in medical or handheld instruments.

Advantages:

- Very compact and low profile.
- Easy to integrate with microcontrollers via a transistor or MOSFET.
- Inexpensive and widely available.

How incorporate Coin flat vibration disks

1. Power Supply

- Most coin vibration disks run on **3 V DC** (safe range ~2–5 V).
- Can be powered directly from batteries (e.g., CR2032, Li-ion, or AA pack).
- For microcontroller projects, run from regulated **3.3 V or 5 V** supply (through a driver transistor/MOSFET).

2. Wiring / Circuit Integration

- They have two terminals (polarity not critical for ERM type).
- Can’t be driven directly from a microcontroller pin (too much current).
- Use a NPN transistor (like 2N2222) or MOSFET (like IRLZ44N small logic-level) as a switch.
- Add a diode (1N4148/1N4007) across the motor to protect from back-EMF.

- 🔧 Example simple Arduino circuit:
- Arduino pin → resistor (1kΩ) → transistor base/gate.
- Motor + terminal → +3V/5V.
- Motor – terminal → transistor collector/drain.
- Emitter/source → GND.

3. Programming / Control

- On Arduino/ESP: use **digitalWrite()** to turn vibration ON/OFF.
- For variable intensity: use **PWM (analogWrite)** to control vibration strength.

4. Mounting / Integration

- Most disks come with **adhesive backing** → stick to PCB, case, or surface.
- Works best when mounted against a **flat, solid surface** for efficient vibration transfer.
- Can be embedded into toys, wearables, game controllers, or feedback devices.

5. Applications

- Wearables → haptic alerts for notifications.
- DIY Projects → buzzers, timers, or silent alarms.
- Robotics → tactile feedback for controllers.
- STEM Kits → fun element for kids (interactive response).

Practical wiring diagram

Let's do a **practical wiring diagram** for incorporating a **coin flat vibration disk** with an **Arduino**.

Because the disk draws more current than an Arduino I/O pin can handle, we'll use a **NPN transistor** as a switch.

Components Needed

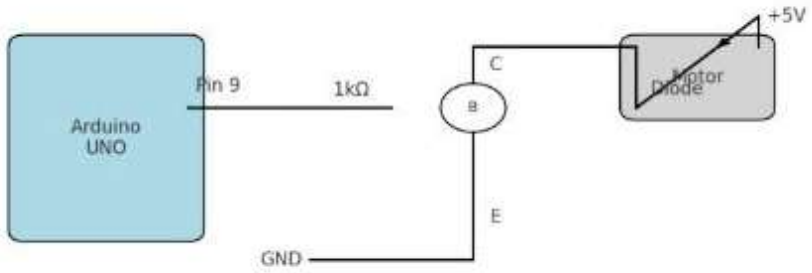
- Arduino (Uno, Nano, etc.)
- Coin flat vibration motor (3V type)
- NPN transistor (2N2222, BC547, S8050, or similar)
- 1 kΩ resistor (base resistor)
- 1N4148 or 1N4007 diode (flyback protection)
- Power source (Arduino 5V or external 3V supply)

Wiring Diagram

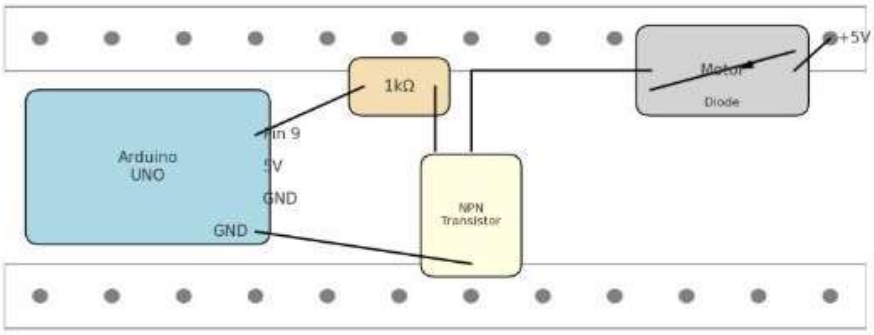
```
Arduino Pin 9 ----[1kΩ]---|B
                          |
                   [ NPN Transistor ]
                          |C
+5V  --------------------+----+ Vibration Motor +
                          |    |
                          |   (Motor)
                         [D]   |
                       Diode   |
GND  -------------------------+--------- Vibration Motor -
```

- **Arduino Pin 9** → 1kΩ resistor → transistor base (B).
- **Transistor emitter (E)** → GND.
- **Motor –** → transistor collector (C).
- **Motor +** → +5V (or 3.3V if motor is rated lower).
- **Diode** across motor (cathode to +5V, anode to transistor collector).

Here's a **proper circuit diagram** showing how to connect a **coin flat vibration motor** to an Arduino using a transistor switch.



Here's a **breadboard-style wiring diagram** showing the Arduino, resistor, NPN transistor, coin vibration motor, and diode.



Example Arduino Code

```
int motorPin = 9;

void setup() {
  pinMode(motorPin, OUTPUT);
}

void loop() {
  // Vibrate for 500 ms
  digitalWrite(motorPin, HIGH);
  delay(500);

  // Stop vibration for 500 ms
  digitalWrite(motorPin, LOW);
  delay(500);

  // Soft vibration effect with PWM
  for (int i = 0; i <= 255; i += 5) {
    analogWrite(motorPin, i);
    delay(20);
  }
  for (int i = 255; i >= 0; i -= 5) {
    analogWrite(motorPin, i);
    delay(20);
  }
}
```

This setup gives you:

- **Simple ON/OFF control with digitalWrite()**
- **Variable intensity with analogWrite() (PWM)**