<div align="center">**Passive buzzer**</div>

1. Learning target
1.1 In this course, we will learn how to use pins of the Raspberry Pi Pico board.
1.2 How to drive the passive buzzer to make a sound.

2. Preparation
Raspberry Pi Pico board *1
Pico sensor expansion board *1
PC *1
USB data cable *1
Passive buzzer module *1
Female-to-male DuPont line *3

The buzzer is divided into active buzzer and passive buzzer.
The active buzzer has an internal oscillation source, which can only achieve a fixed frequency sound.
The passive buzzer does not have an internal oscillation source, so if it is unable to make a sound with a DC signal, it needs to be driven by a square wave. The sound frequency is controllable, and square waves with different frequencies can achieve different frequencies of sound, which can realize playing music and so on.
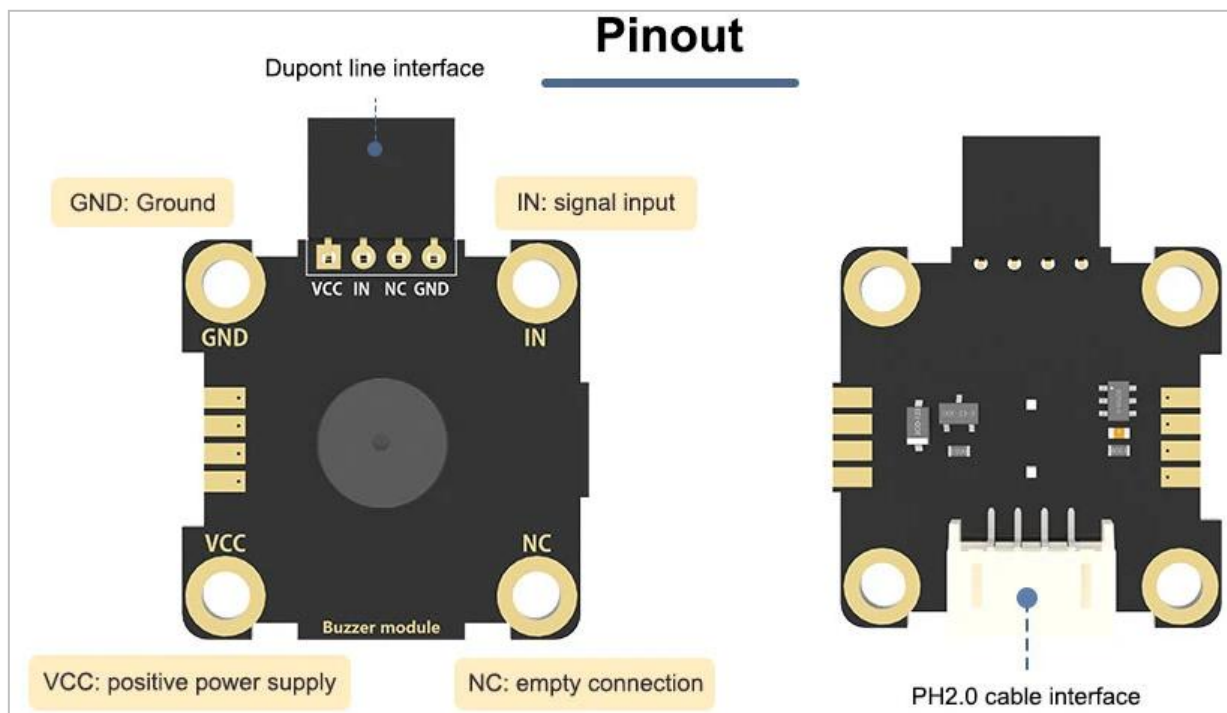
3. About wiring

Passive buzzer	Pico sensor expansion board
IN	GP15
VCC	5V
GND	GND
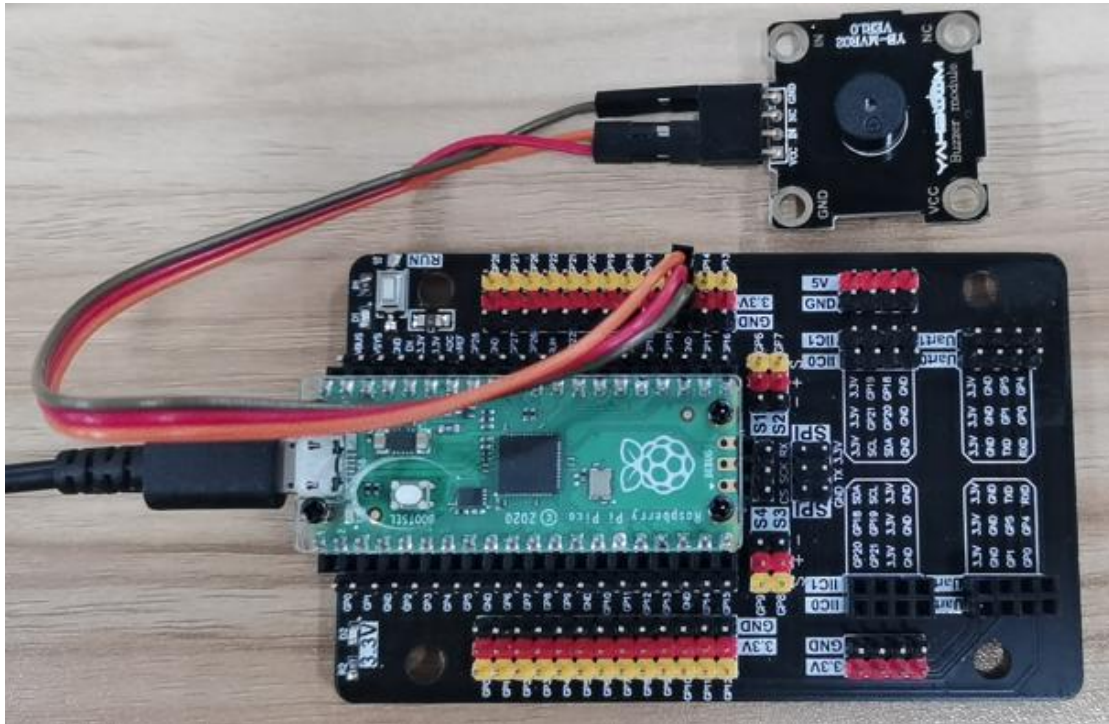
4. About code
Thonny programming

About how to using ThonnyIDE, please check the tutorials in 【2.Development environment】

```python
from machine import Pin
import utime

# Initialize passive buzzer
buzzer = Pin(15, Pin.OUT)

# Simulate two different frequencies
while True:
    # Output 500HZ frequency sound
    for i in range(80):
        buzzer.value(1)
        utime.sleep(0.001)
        buzzer.value(0)
        utime.sleep(0.001)

    # Output 250HZ frequency sound
    for i in range(100):
        buzzer.value(1)
        utime.sleep(0.002)
        buzzer.value(0)
        utime.sleep(0.002)
```

5. Phenomenon

Click the green run button of Thonny IDE to start running the program. Click the red stop

button to stop the program. When the program is running, passive buzzer will emit two

sounds with different frequencies.