

BME688 Environmental Sensor 4-in-1 Product Brief

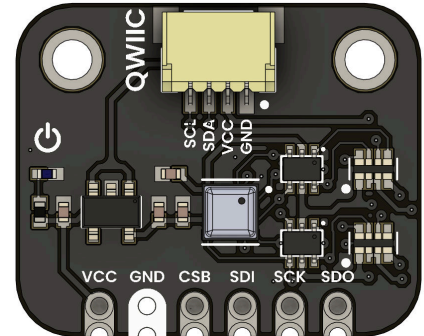
Versatile sensor module

Version: 1.0

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Introduction

The BME688 Environmental Sensor 4-in-1 is a versatile sensor module that combines temperature, humidity, pressure, and gas sensing capabilities in a single compact package.



Functional Description

- Accurately measures ambient moisture for precise environmental monitoring.
- Detects atmospheric pressure changes to support dynamic weather tracking.
- Delivers consistent temperature readings even under varying conditions.
- Monitors a range of gases to help identify potential environmental hazards.

Electrical Characteristics

- Power supply: 1.71V to 3.6V
- Low power consumption: sleep $\leq 0.1 \mu\text{A}$, typical operation $\leq 3 \mu\text{A}$

Features

- Temperature measurement: -40 to $+85 \text{ }^{\circ}\text{C}$, $\pm 0.5 \text{ }^{\circ}\text{C}$ accuracy
- Humidity measurement: 0 to 100 - Barometric pressure: 300 to 1100 hPa, $\pm 1 \text{ hPa}$ accuracy
- VOC detection: Indoor Air Quality (IAQ) index
- Dual interface: I²C (Qwiic) and SPI
- Compact form factor: Qwiic connector + standard through-hole pins

Applications

- Environmental Monitoring: Ideal for tracking air quality, humidity, temperature, and pressure in smart homes and industrial applications.
- IoT Devices: Can be integrated into IoT systems for real-time environmental data collection and analysis.
- Weather Stations: Useful in DIY weather stations for accurate weather forecasting and monitoring.
- Smart Agriculture: Helps in monitoring soil and air conditions to optimize crop growth and yield.
- Wearable Devices: Can be used in health and fitness wearables to monitor

Settings

Interface Overview

Interface	Signals / Pins	Typical Use
UART	–	Unavailable
I ² C	SDA, SCL (CSB held high)	Default interface (Qwiic connector)
SPI	CSB = GND, SDI (MOSI), SCK, SDO (MISO)	High-speed alternative
USB	–	Unavailable on this module

Supported Pins

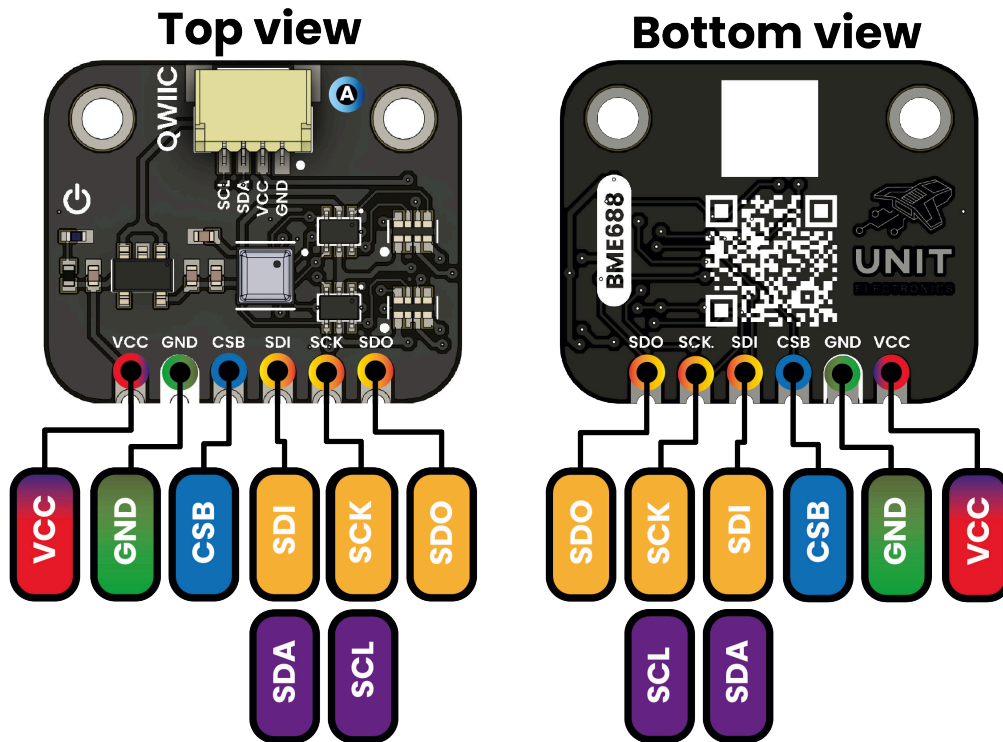
Symbol	I/O	Description
VCC	Input	3.3V or 5V
GND	GND	Common ground for all components

Pin & Connector Layout

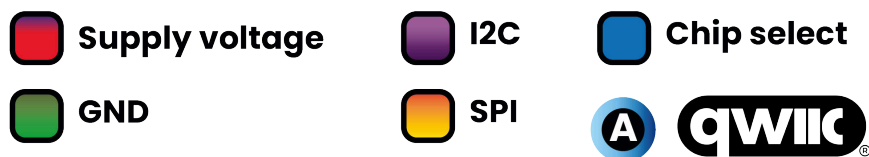
Group	Available Pins	Suggested Use
GPIO	—	Not applicable
UART	—	Not supported
TouchPad	—	Not supported
Analog	—	Not supported
SPI	CSB, SDI (MOSI), SDO (MISO), SCK	High-speed SPI to read sensor data
I ² C	SDA, SCL (via Qwiic connector)	Standard I ² C for configuration
data acquisition		

Block Diagram

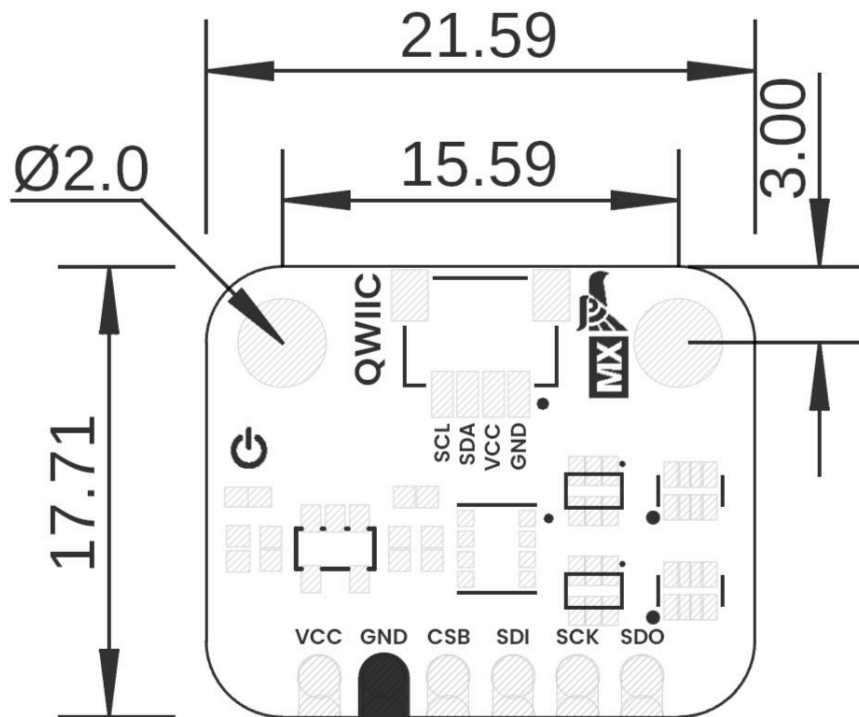
PINOUT



Description:



Dimensions



Mechanical dimensions in millimeters (mm)

Usage

- Arduino IDE (Adafruit BME680/BME688 library)
- PlatformIO (Arduino or Espressif frameworks)
- Raspberry Pi / Python (Adafruit CircuitPython-BME680)
- MicroPython (I²C/SPI firmware)
- ESP32 / ESP8266 (Arduino or ESP-IDF)

Downloads

- Schematic PDF
- Board Dimensions DXF
- Pinout Diagram PNG

Purchase

- Buy from vendor
- Product page