BME688 Environmental Sensor 4-in-1 Product Brief
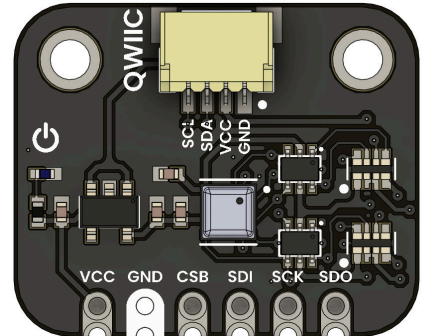
Versatile sensor module

Version: 1.0

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 ¡ 0.1 µA, typical operation ¡ 3 µA

Features

- Temperature measurement: –40 to +85 ℃, ±0.5 ℃ accuracy
- Humidity measurement: 0 to 100 - Barometric pressure: 300 to 1100 hPa, ±1 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

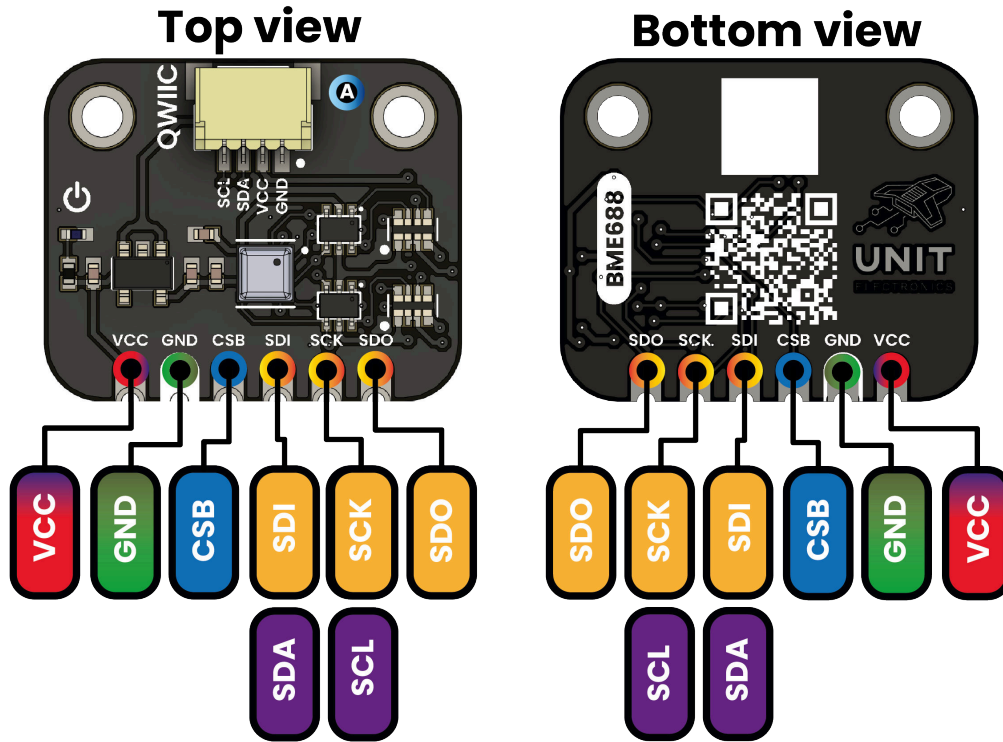| Interface	Signals / Pins	Typical Use
UART	–	Unavailable
I²C	SDA, SCL (CSB held high)	Default interface (Qwiic connector)
SPI	CSB = GND, SDI (MOSI), SCK, SDO (MISO)	High-speed alternative
USB	–	Unavailable on this module

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
I²C	SDA, SCL (via Qwiic connector)	Standard I²C for configuration
data acquisition		

Block Diagram

PINOUT

Top view

Bottom view

Description:

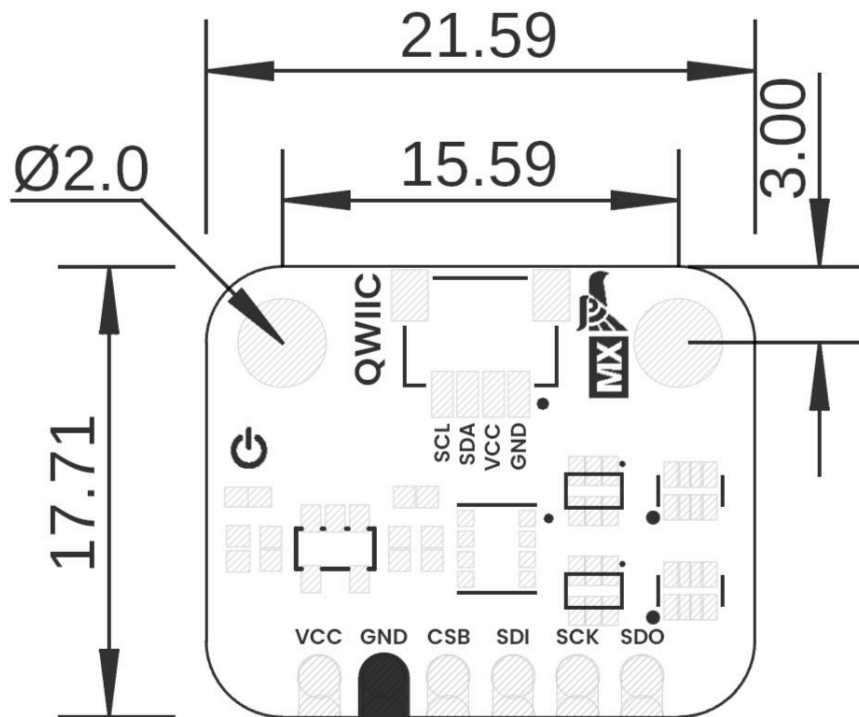🟥 **Supply voltage** 🟪 **I2C** 🟦 **Chip select**

🟩 **GND** 🟧 **SPI** Ⓐ QWIIC ®
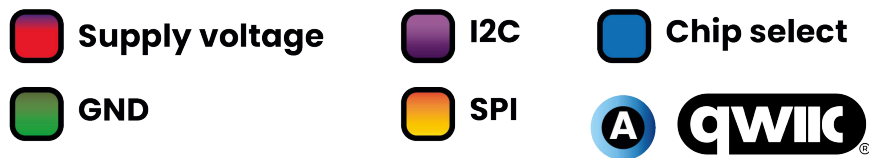
Dimensions

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