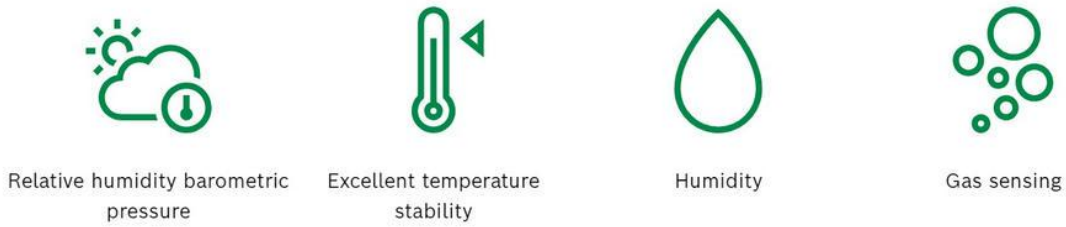
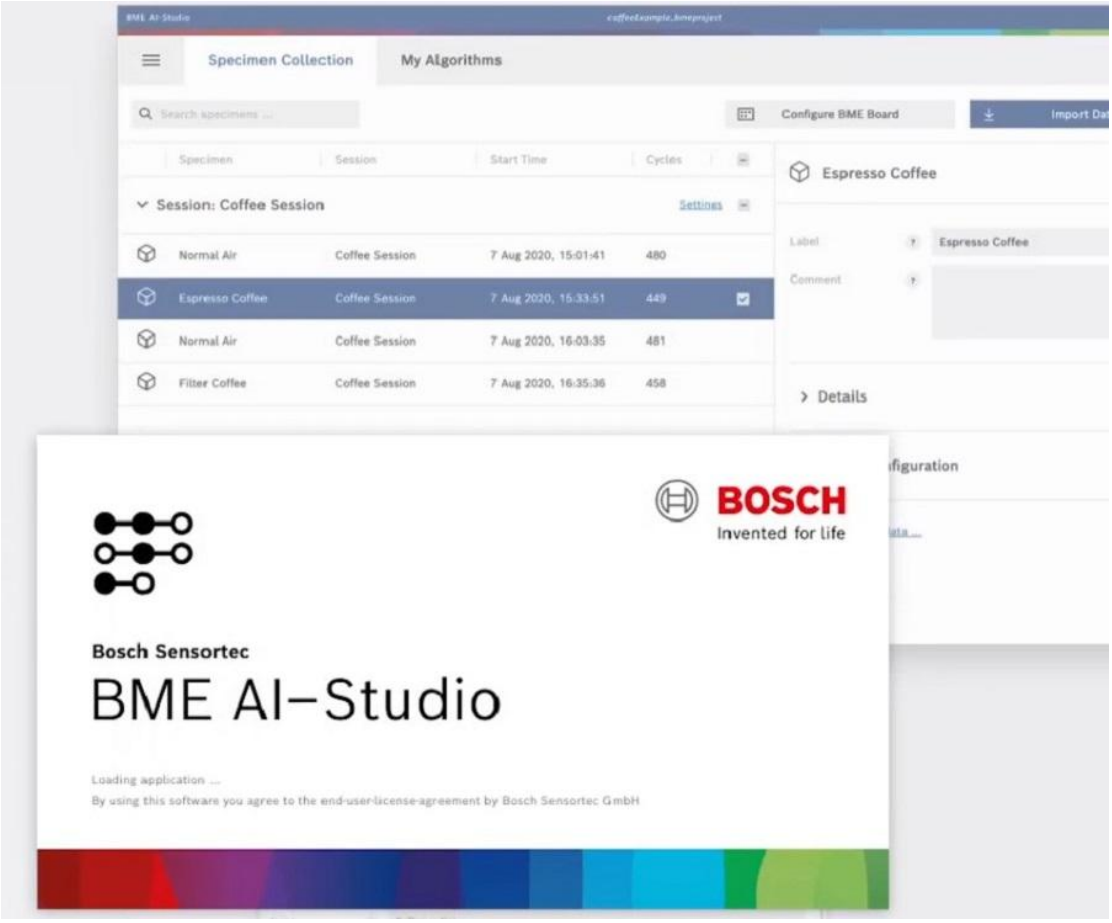
Introduction

The DFRobot Gravity BME688 Environmental Sensor is an advanced, compact MEMS sensor that provides accurate measurements of **temperature, humidity, barometric pressure**, and volatile organic compounds (**VOC**). It supports **I2C/SPI** communication protocols, which facilitate integration with various systems. It also serves as a data source for **AI gas analysis**, making it an ideal choice for applications requiring precise environmental monitoring and intelligent gas detection. This sensor is well-suited for DIY weather stations, portable environmental monitoring devices, smart home systems, and agricultural monitoring.



AI Gas Analysis

The BME688's AI-driven gas analysis capability sets it apart from the previous BME680 model. It is particularly valuable for air quality monitoring systems, environmental research, and industrial safety. Using the Bosch BME AI-Studio and BSEC2-Arduino library, customized AI gas analysis can be implemented to detect and analyze specific gas profiles.



Highly Accurate Environmental Sensing

The BME688 sensor enhances the precision of temperature measurements, boasting an accuracy of ±0.5°C. These improvements render the sensor ideal for applications requiring highly accurate environmental data, including scientific experiments, climate research, and industrial environmental monitoring.

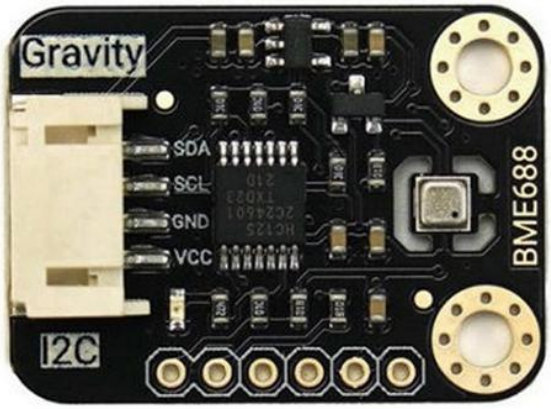
Advanced Air Quality Monitoring

The Gravity BME688 excels in indoor air quality monitoring, detecting harmful VOCs and providing real-time data for smart homes. Its built-in heating layer ensures stable, accurate measurements by minimizing ambient interference.

Sensor Data IAQ Index	Air Quality
0 – 50	good[10]
51 – 100	average
101 – 150	little bad
151 – 200	bad
201 – 300	worse[2]
301 – 500	very bad

Compact Design

With dimensions of just 22*30mm, the BME688 is ideal for compact and portable weather stations, smart home setups, and agricultural monitoring systems.



Applications

- DIY weather stations
- Portable environmental monitoring devices
- Smart home systems
- Agricultural monitoring

Specification

Power Requirements

- Operating Voltage: 3.3 to 5V DC
- Operating Current: 5mA (25mA with VOC Measurement Enabled)

Output Signal

Interface Options: I2C/SPI

Temperature Sensor

Measurement Range: -40 to +85°C

Accuracy: ±0.5°C (0 to 65°C)

Humidity Sensor

Measurement Range: 0 to 100% Relative Humidity (R.H.)

Accuracy: ±3% R.H. (20 to 80% R.H. at 25°C)

Barometric Pressure Sensor

Measurement Range: 300 to 1100 hPa

Accuracy: ±0.6 hPa (300 to 1100 hPa at 0 to 65°C)

Physical Dimensions

Module Size: 30 mm x 22 mm / 1.18 inches x 0.87 inches

Documents

Product wiki

Pinout

Tutorial

Arduino library API list

Compatible test

Schematic

PCB layout

BME688 datasheet

Shipping List

Gravity: I2C BME688 Environmental Sensor x1

Gravity UART / I2C sensor cable x1

XH2.54-10pin Header x1