PI3G BME688 BREAKOUT BOARD V1.1

preliminary datasheet v0.2

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CHANGELOG

Date	Datasheet version	Change
26.3.2021	v0.2 (for v1.1)	• removed Grove compatibility information for v1.1, as the connectors are not compatible • added information about **decoupling capacitor** • added information about AI studio compatibility

PURCHASING

purchase it here:

https://buyzero.de/products/luftqualitatssensor-bosch-bme688-breakout-board?variant=39417204801716

the board will be available to purchase through selected partners shortly.

IDENTIFYING V1.1

Version 1.1 of the breakout board is the first released version. It does **not** have a silk-screened version number on top of it.

WARNINGS

- Do not touch the sensor!
- Only use **3.3V power and data signal levels**, higher voltages will damage the sensor.

FEATURES

BME688 Sensor features

- low power consumption (3.9 mA in standard gas scan mode, value for BME688 sensor chip)
- resistive VOC measurement (volatile organic compounds)
- IAQ (indoor air quality) calculation with BSEC Library from Bosch
- identification of different gas mixtures, sensor is trainable with Bosch's AI Studio

Sensor Operating Range

- Pressure: 300...1100 hPa
- Humidity: 0...100%
- Temperature: -40...85 °C

Interfaces

- Header to plug into the Raspberry Pi
- unpopulated header, pinout is Pico-compatible (*zero-solder technology **)
- 2 x connectors (I2C / 3.3V)
    - **max 50 mA current draw** for board & these connectors when powered through the Raspberry Pi for v1.1!
- 3.3 V data level (compatible with Raspberry Pi)
- 3.3 V supply voltage
    - powered directly by the 3.3V power rail on the Raspberry Pi
- I2C interface

Other features

- address of the BME688 adjustable via J1 and GPIO pin (ADDR)
- two mounting holes
- space for cable ties, for easy mounting
- the BME688 sensor module is thermally decoupled to a large extent (-> higher measurement accuracy!)

ZERO SOLDER TECHNOLOGY

By slightly offsetting the pins of the unpopulated header (X1), the enclosed header can simply be plugged in, and clamps - so our gas sensor breakout board can be plugged directly onto breadboards without soldering!

ADDRESSES & PIN-OUT

I2C default address: 0x77

I2C alternative address: 0x76 (can be set by soldering J1, or pulling ADDR to GND)

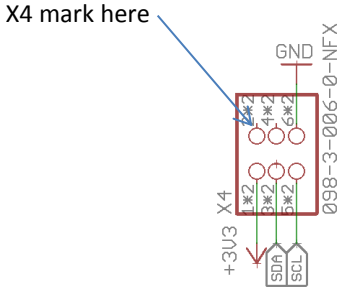
- leave ADDR floating if I2C address 0x77 is desired

RASPBERRY PI HEADER

connection to Raspberry Pi as shown

Attention! This board is connected in an unusual way - due to the Bosch sensor detecting heat & humidity, which would be influenced by the SoC heat, the board is connected to the opposite end!

X4 header, pinout:

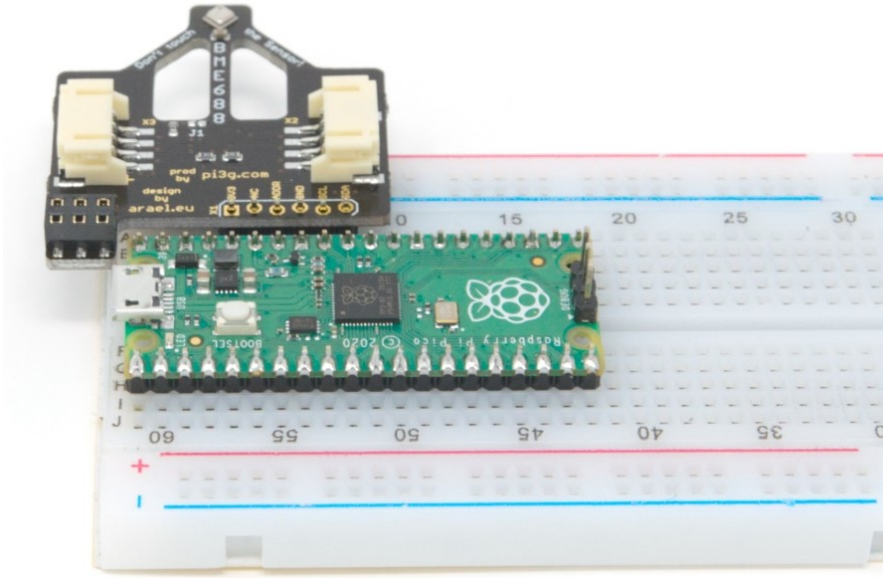


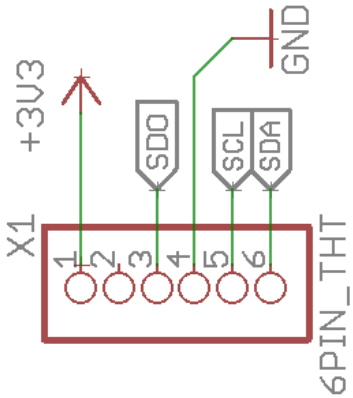
PICO HEADER

note: this header is designed for being breadboard pin-compatible with the Raspberry Pi Pico.

Align the 3V3 pin with the 3V3 (OUT) pin of the pico.

The Raspberry Pi header will help you to align this - it is designed for a precise match:



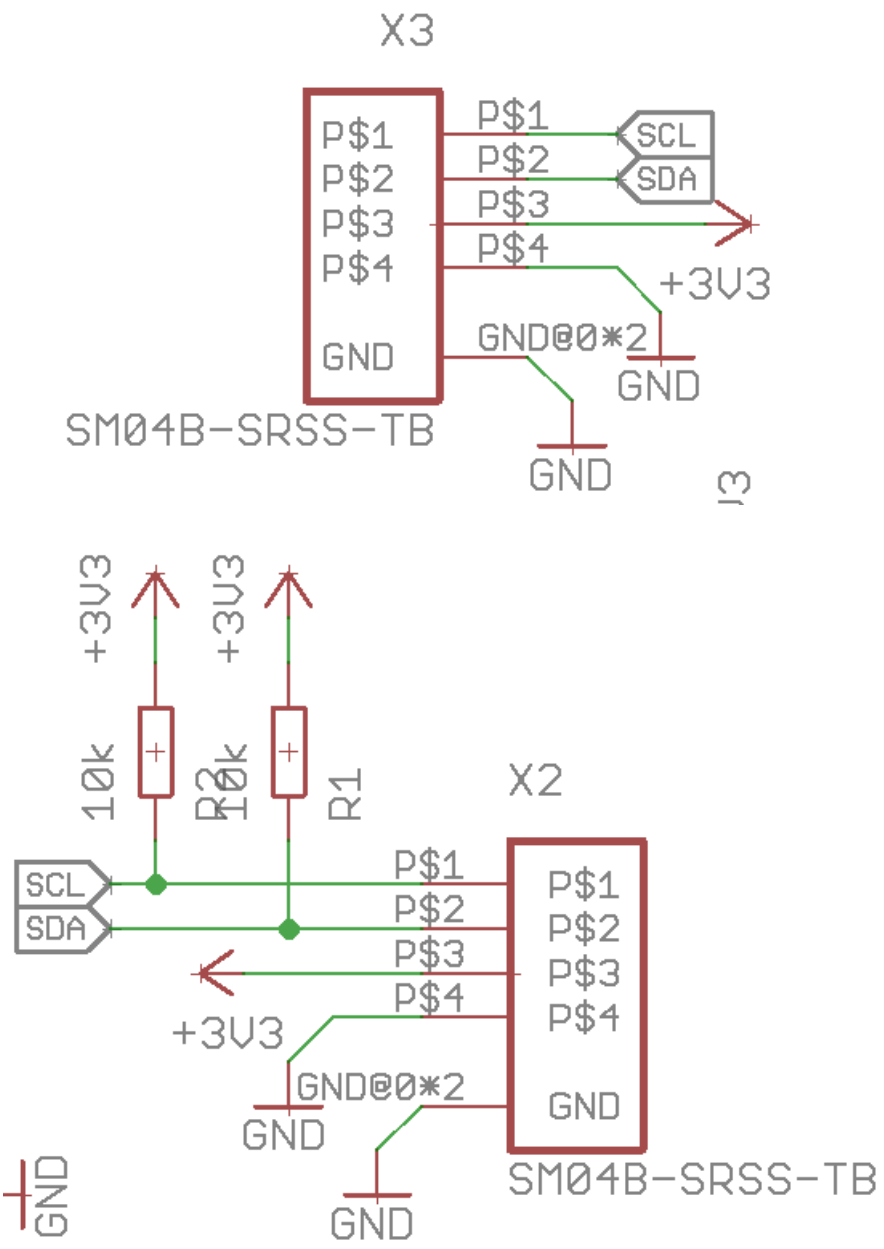


The header is not populated (the pin header is not pre-soldered, only inserted during transport - it can be removed easily).

PLUGS

Two plugs are provided

attention: these plugs are only 3.3V compatible! Do not attempt to use the board with 5 V logic levels, it is not protected!


X3
P$1
P$2
P$3
P$4
GND
P$1
P$2
P$3
P$4
GND@0*2
SCL
SDA
+3V3
GND
GND
SM04B-SRSS-TB
J3
+3V3
+3V3
10k
10k
R2
R1
X2
SCL
SDA
P$1
P$2
P$3
P$4
GND
+3V3
GND@0*2
GND
GND
GND
SM04B-SRSS-TB

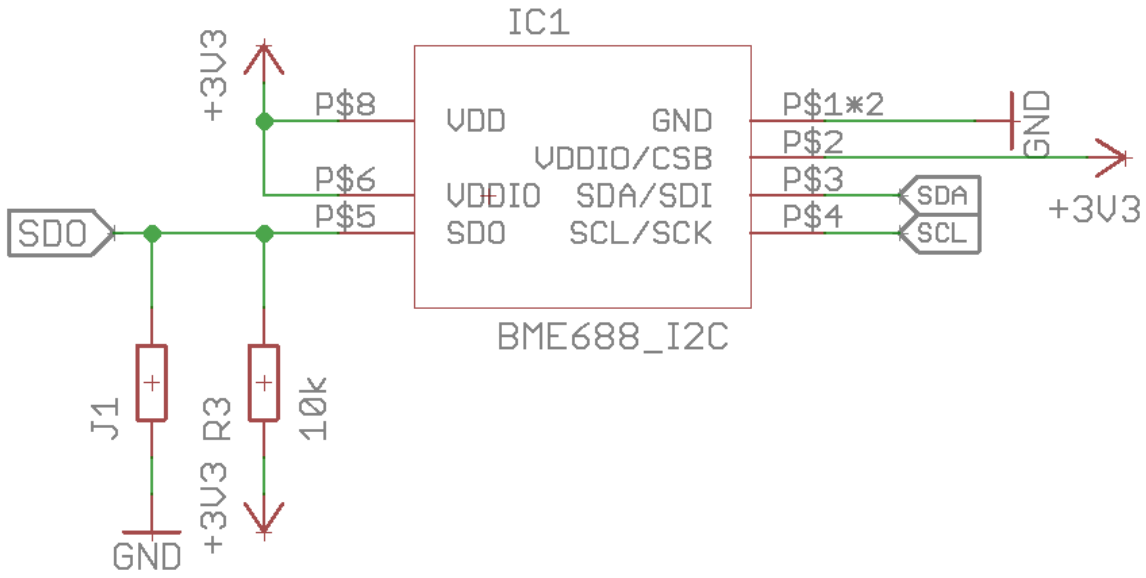
NOTES

PULLUPS

- SCL and SDA already have on-board 10k pullups, thus you do not need to add pullups of your own.

SENSOR PINOUT

The sensor is connected according to the following pinout:



DECOUPLING CAPACITOR

As the sensor requires internal heating to do it's gas measurements, the board has a **1uF** decoupling capacitor just next to the sensor.

SOFTWARE SUPPORT

Bosch provides a BME68x Sensor API for basic functionality:

- https://github.com/BoschSensortec/BME68x-Sensor-API

Advanced functionality - AI features and calculation of IAQ will be provided by the (closed source) BSEC 2.0 library. It is due to be available end of March.

AI STUDIO COMPATIBILITY

AI Studio compatibility for this breakout board will be released soon by us.