RAK12037 WisBlock CO2 Sensor Module Datasheet

Overview

Description

RAK12037 is a WisBlock Sensor that extends the WisBlock system based on the SCD30 module. This module uses NDIR CO2 sensor technology to sense CO2 and has an integrated temperature and humidity sensor. Ambient humidity and temperature can be measured by monitoring and compensating for external heat sources without the need for additional components. The small module height allows easy integration into different applications. The SCD30 features dual-channel detection for superior stability and ±30ppm + 3% accuracy.

Features

- Voltage supply: **3.3 V ~ 5.5 V**
- Current consumption: **19 mA @ 1 meas. per 2s**
- Chipset: **SCD30**
- Temperature range: **-40° C ~ 70° C**
- Measurement range: **400 ppm – 10.000 ppm**
- Accuracy: **±(30 ppm + 3%)**
- Integrated temperature, humidity sensor, and CO2 sensor
- Dual-channel detection for superior stability
- I2C interface
- Fully calibrated and linearized
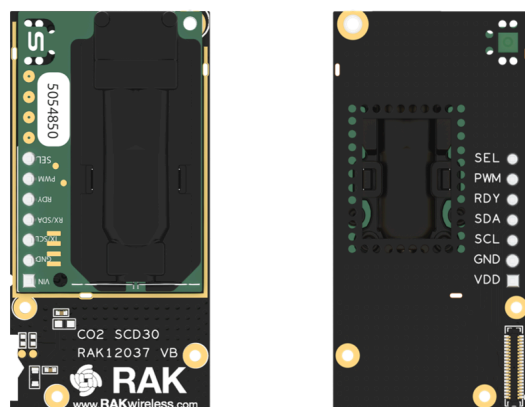
Specifications

Overview

Figure 1: RAK12037 WisBlock CO2 Sensor Module top and bottom view

Mounting

Figure 2 shows the mounting mechanism of the RAK12037 module on a WisBlock Base ⤢
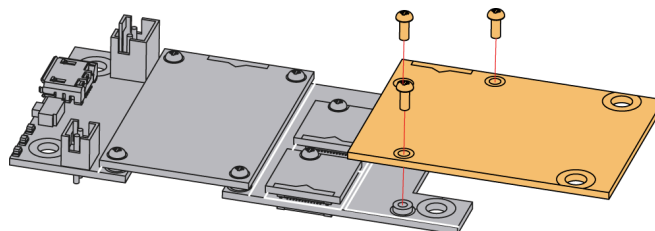board. The RAK12037 module can be mounted on the IO slots.

Figure 2: RAK12037 WisBlock sensor mounting

Hardware

The hardware specification is categorized into five (5) parts. It shows the chipset of the
module and discusses the pinouts and their corresponding functions and diagrams. It also
covers the electrical and mechanical parameters that include the tabular data of the
functionalities and standard values of the RAK12037 WisBlock CO2 Sensor.

Chipset

Vendor	Part number
Sensirion	SCD30

Pin Definition

The RAK12037 WisBlock CO2 Sensor comprises a standard WisBlock connector. The
WisBlock connector allows the RAK12037 module to be mounted to a WisBlock Base board.
The pin order of the connector and the pinout definition is shown in Figure 3.

Figure 3: RAK12037 WisBlock Sensor pinout diagram

> 💡 **NOTE**
>
> - Only the **I2C** related pins, **PWM**, **RDY**, **3V3_S**, and **GND** are connected to this module.
> - **3V3_S** voltage output from the WisBlock Base that powers the RAK12037 module can be controlled by the WisBlock Core via `WB_IO2` (WisBlock IO2 pin). This makes the module ideal for low-power IoT projects since the WisBlock Core can totally disconnect the power of the RAK12037 module.

Electrical Characteristics

Electrical and Sensor Specifications

Parameter	Transmission Mode	Value
Voltage supply	-	3.3 V ~ 5.5 V
CO2 measurement range	I2C, PWM	0 ~ 40'000 ppm, 0 ~ 5'000 ppm
Humidity range	-	0% ~ 100% RH
Temperature range	-	-40° C ~ 70° C

Mechanical Characteristics

Board Dimensions

Figure 4 shows the dimensions and the mechanic drawing of the RAK12037 module.
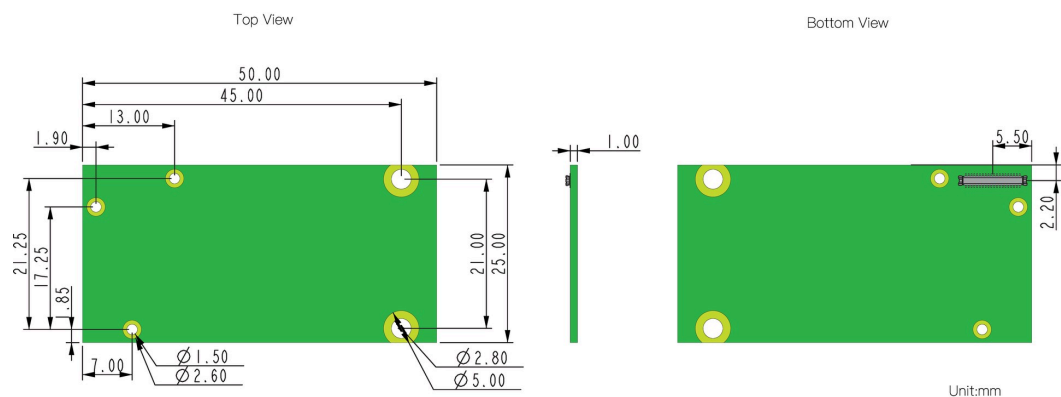
Figure 4: RAK12037 WisBlock Sensor mechanical drawing
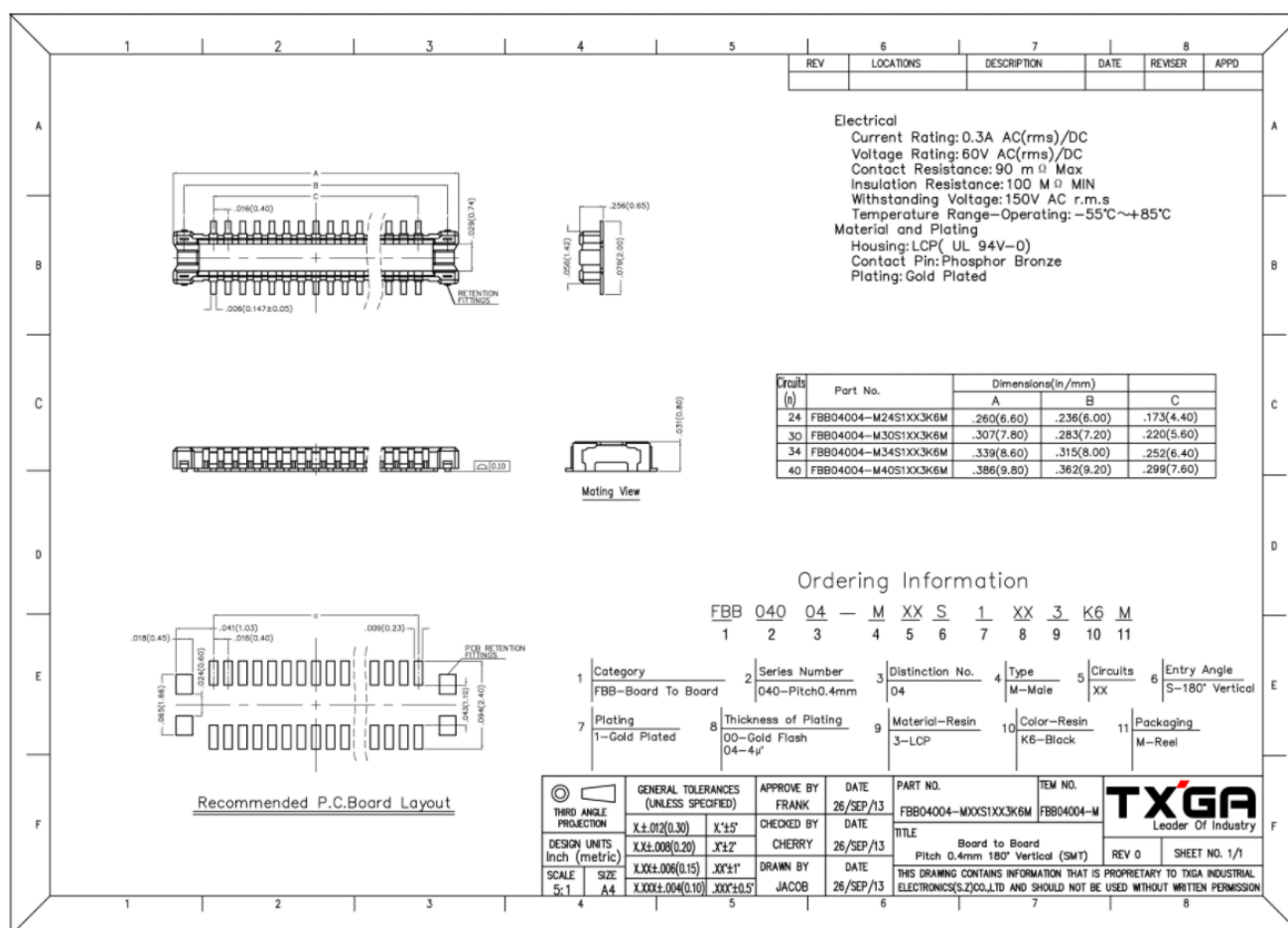
WisBlock Connector PCB Layout

Figure 5: WisBlock Connector PCB footprint and recommendations

Schematic Diagram

SCD30 sensor Related Circuits

The default I2C address of the SCD30 sensor is **1100001**.

Resistors **R2** and **R3** do not need to be mounted on the RAK12037 module due to the pull-up resistors already built-in on the WisBlock Base board.
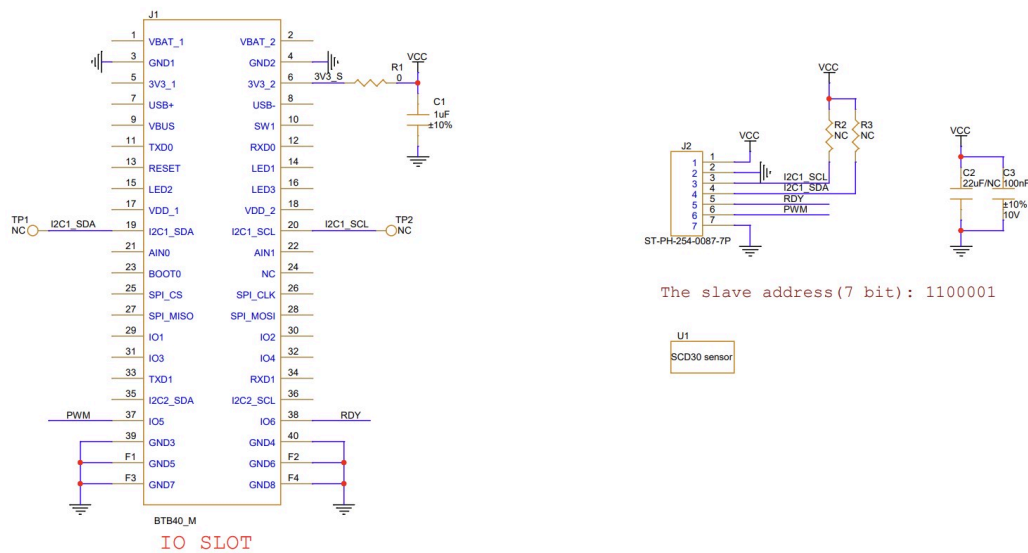
Figure 6: RAK12037 WisBlock sensor schematics

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