

XENSIV™ PAS CO2 mini-board description and application hints

About this document

This application note should enable the user to integrate the XENSIV™ PAS CO2 mini-board into a system.

Scope and purpose

This application note will give a complete overview of the XENSIV™ PAS CO2 mini-board.

Intended audience

Application engineers, system engineers and system architects of an application where the XENSIV™ PAS CO2 mini-board will be integrated.

Order information

SP005577475

Table of contents

About this document	1
Table of contents	1
1 Introduction to XENSIV™ PAS CO2 mini-board	2
2 Example connection with the PSoC® 6 WiFi-BT Pioneer Kit	4
Revision history	5

XENSIV™ PAS CO2 mini-board

description and application hints

1 Introduction to XENSIV™ PAS CO2 mini-board

The XENSIV™ PAS CO2 is a real CO₂ sensor that improves on the size and performance of existing CO₂ sensor solutions. The sensor's high accuracy level makes it the right choice for indoor air-quality monitoring stations, HVAC systems and IoT applications. To ensure successful evaluation of the sensor, multiple evaluation platforms are offered. Among them, the XENSIV™ PAS CO2 Sensor2Go kit has been covered in a separate application note. The second evaluation platform is called the XENSIV™ PAS CO2 mini-board, which is covered in this application note.

The XENSIV™ PAS CO2 mini-board comes with the following features:

- Easy connection to the application board with a standard 2.54 mm pin header. There is no need to go through a reflow process during the evaluation phase.
- Access to all signals and functions of the product.
- Compatible with a combined PCB layout, supporting reflow assembly for later use.
- Compatible with XENSIV™ PAS CO2 Sensor2Go kit for easy lab evaluation.

We encourage use of the combi-layout feature to evaluate the application fit of the sensor. The footprint of the original PAS should already be envisioned during the design-in phase. The evaluation can be carried out with the mini-board and, after primary evaluation, the XENSIV™ PAS CO2 can be used directly for the final product. The example combi-layout is shown in Figure 1. The reference Altium file can be downloaded from the download section of the product page.

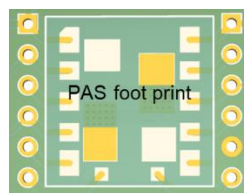


Figure 1 Example combi-layout of XENSIV™ PAS CO2 mini-board

The XENSIV™ PAS CO2 mini-board can be connected using two methods:

- **Method 1:** Connect with the XENSIV™ PAS CO2 Sensor2Go kit

The Sensor2Go kit is offered as a combination of a motherboard with a power management circuit, and a mini-board as shown in Figure 2. The Sensor2Go kit is powered via USB, and 5 V from the USB is stepped down to 3.3 V and stepped up to 12 V to ensure appropriate input voltage for the XENSIV™ PAS CO2. The Sensor2Go kit also comes with a user-friendly GUI, which can be downloaded from Infineon Toolbox.

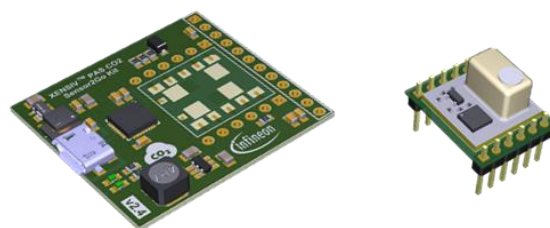


Figure 2 The connection between the Sensor2Go kit and the mini-board

XENSIV™ PAS CO2 mini-board

description and application hints

- **Method 2:** Connect with an external microcontroller separately

The mini-board can also be treated as an actual XENSIV™ PAS CO2 with a connector. Therefore, a standalone mini-board needs to be powered separately. The relevant pins of the sensor are extended to a connector pin set, as shown in Figure 3.

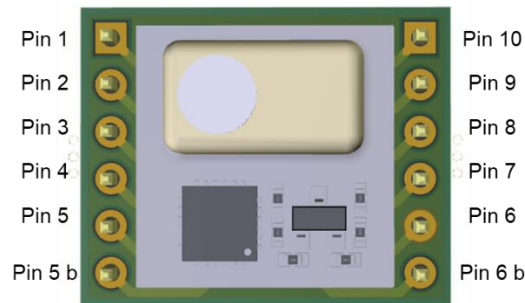


Figure 3 Top view of the XENSIV™ PAS CO2 mini-board

The relevant pin description of the XENSIV™ PAS CO2 mini-board is identical to the standalone sample, shown in the following table.

Pin	Symbol	Type	Description
1	VDD3.3	Power supply (3.3 V)	3.3 V digital power supply
2	RX	Input	UART receiver pin
3	SCL	Input/Output	I ² C clock pin (3.3 V domain)
4	TX/SDA	Input/Output	UART transmitter pin (3.3 V domain)/I ² C data pin (3.3 V domain)
5	PWM_DIS	Input	PWM disable input pin (3.3 V domain)
5b	SWD	N/A	Do not connect
6b	SWCLK	N/A	Do not connect
6	GND	Ground	Ground
7	INT	Output	Interrupt output pin (3.3 V domain)
8	PSEL	Input	Communication interface select input pin (3.3 V domain)
9	PWM	Output	PWM output pin (3.3 V domain)
10	VDD12	Power supply (12 V)	12 V power supply for the IR emitter

Note: Before performing the evaluation, it is recommended to perform Forced Compensation (FC) or enable Automatic Baseline Offset Correction (ABOC).

XENSIV™ PAS CO2 mini-board

description and application hints

2 Example connection with the PSoC® 6 WiFi-BT Pioneer Kit

The mini-board can be connected to a PSoC® 6 microcontroller to investigate the application fit of the XENSIV™ PAS CO2. In this example, the mini-board has been connected with the PSoC® 6 WiFi-BT Pioneer Kit. The PSoC® 6 microcontroller contains a dual-CPU architecture, with both CPUs on a single chip. It has an ARM® Cortex®-M4 for high-performance tasks and an ARM® Cortex®-M0+ for low-power tasks. With security built in, your IoT system is protected.

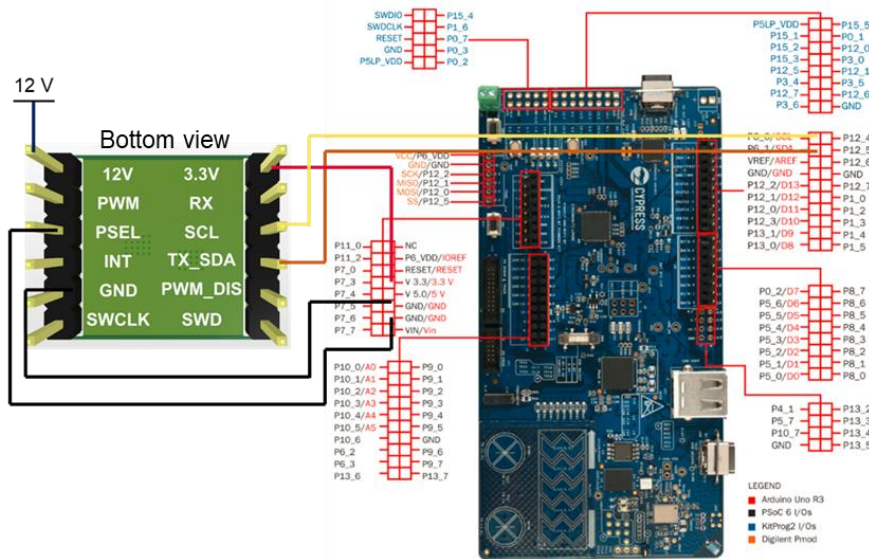


Figure 4 XENSIV™ PAS CO2 mini-board connected to the PSoC® 6 WiFi-BT Pioneer Kit

Mini-board pin	Mini-board signal	PSoC®6 WiFi-BT Pioneer Kit signal	Comment
1	VDD3.3	V 3.3	3.3 V digital power supply
2	RX	-	Not connected
3	SCL	P6_0/SCL	I ² C clock pin (3.3 V domain)
4	TX_SDA	P6_1/SDA	I ² C data pin (3.3 V domain)
5	PWM_DIS	-	Not connected
5b	SWD	-	Not connected
6b	SWCLK	-	Not connected
6	GND	GND	Ground
7	INT	-	Not connected
8	PSEL	GND	Ground
9	PWM	-	Not connected
10	VDD12	-	External 12 V power supply

Further details on programming can be found in a separate application note, “Programming guide for XENSIV™ PAS CO2”.

XENSIV™ PAS CO2 mini-board

description and application hints



Revision history

Document version	Date of release	Description of changes
V1.0	02.06.2021	Creation
V1.1	26.08.2021	Updated notes

Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

Edition 2021-08-266

Published by

Infineon Technologies AG

81726 Munich, Germany

© 2022 Infineon Technologies AG.

All Rights Reserved.

Do you have a question about this document?

Email: erratum@infineon.com

Document reference

UM_2106_PL38_2106_100511

IMPORTANT NOTICE

The information contained in this application note is given as a hint for the implementation of the product only and shall in no event be regarded as a description or warranty of a certain functionality, condition or quality of the product. Before implementation of the product, the recipient of this application note must verify any function and other technical information given herein in the real application. Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind (including without limitation warranties of non-infringement of intellectual property rights of any third party) with respect to any and all information given in this application note.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.