

## USER MANUAL

EVALUATION BOARD FOR  
HUMIDITY SENSOR  
WSEN-HIDS

2525020210092, 2525020210093

VERSION 1.2

MAY 12, 2025

**WÜRTH ELEKTRONIK** MORE THAN YOU EXPECT

## Revision history

Manual version	Product version	Notes	Date
1.0	1.0	<ul style="list-style-type: none"> <li>Initial release of the manual</li> </ul>	September 2023
1.1	1.0	<ul style="list-style-type: none"> <li>Updated chapter Important notes</li> <li>Updated chapter Legal notice</li> </ul>	October 2024
1.2	1.0	<ul style="list-style-type: none"> <li>Added chapter WSEN-ACCE filter cap compatibility</li> <li>Added chapter Ordering Information</li> <li>Added chapter WSEN-ACCE filter cap connection</li> <li>Added Schematic diagram 2525020210093 and Layout 2525020210093</li> <li>updated the chapter Through-hole connection (P1 &amp; P2)</li> </ul>	May 2025

## Abbreviations

Abbreviation	Description
I <sup>2</sup> C	Inter Integrated Circuit
LSB	Least Significant Bit
MEMS	Micro Electro Mechanical System
SMD	Surface Mount Device

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# 1 General description

## 1.1 Introduction

The EV-Board of the humidity sensor provides the opportunity to verify the sensor performance and develop a prototype using an external processor, e.g. sensor shield for Arduino (Part No. 2501000101291). It can be directly plugged into a sensor shield for Arduino using the mounted I<sup>2</sup>C pins. The EV-Board can also be mounted on a bread board using through-hole pin header connections. The humidity sensor (Part No: 2525020210002) is a 16-bit digital ultra-low-power module with an integrated temperature sensor.



Figure 1: EV-Board of the humidity sensor

## 1.2 Pin header compatibility

6-pin right angle headers mounted on this EV-Board can be directly plugged into the sensor shield for Arduino. This provides a plug-and-play solution to quickly take the EV-Board into operation.



The Sensor Shield for Arduino is a stackable extension board that makes it easy to connect sensor EV-Board. It is compatible with Arduino UNO, DUE, and STM32 Nucleo (Nucleo-64 format). More information can be found on our website [here](#).

### 1.3 WSEN-ACCE filter cap compatibility

The EV-Board (Part number: 2525020210093) is designed also to accommodate the WSEN-ACCE filter cap (part number: 2500060600000) using a press-fit mechanism, as described in the filter cap user manual. This ensures a secure and reliable attachment without requiring additional modifications. This compatibility allows users to assess the performance and effectiveness of the filter cap in protecting the humidity sensor from contaminants such as dust, water, and particles while maintaining accurate sensor readings. More information can be found on our website [here](#).

### 1.4 Ordering Information

Part number	Compatibility with WSEN-ACCE filter cap	Included products
2525020210092	Not Compatible.	2525020210002 (WSEN-HIDS humidity sensor) + 61300211121 (1x2 pin header)
2525020210093	Compatible.	2525020210002 (WSEN-HIDS humidity sensor) + 2500060600000 ( WSEN-ACCE filter cap) + 61300211121 (1x2 pin header) + O-ring

Table 1: Ordering information

## 2 Functional description

The humidity sensor EV-Board supports I<sup>2</sup>C communication interfaces.

- A positive supply voltage is applied to the sensor through the *VDD* pin and negative supply voltage through the *GND* pin.

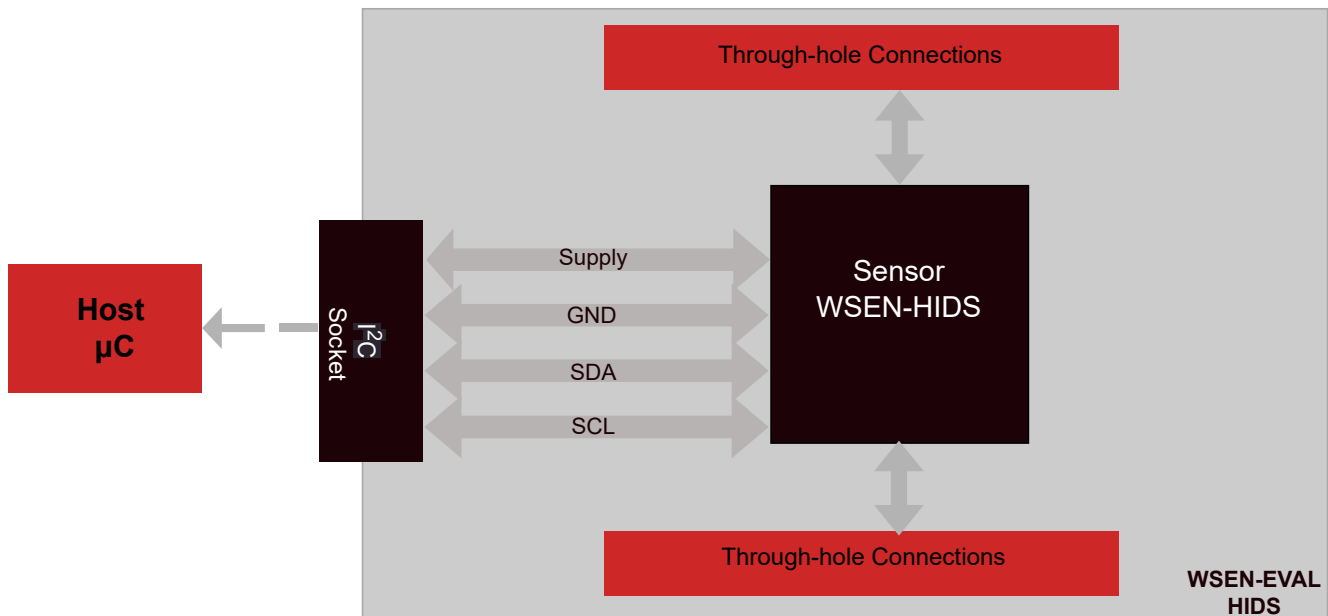


Figure 2: Block diagram



The 7-bit slave address of the humidity sensor is 1000100b (0x44)



Please refer to the datasheet and the user manual of the humidity sensor (Part No: 252502021002) for information about the electrical properties.

2.1 EV-Board in operation

2.1.1 I<sup>2</sup>C connection (CON1)

The pinning of connector CON1 provides an I<sup>2</sup>C communication interface which fits directly into the sensor shield for Arduino in section 1.2.

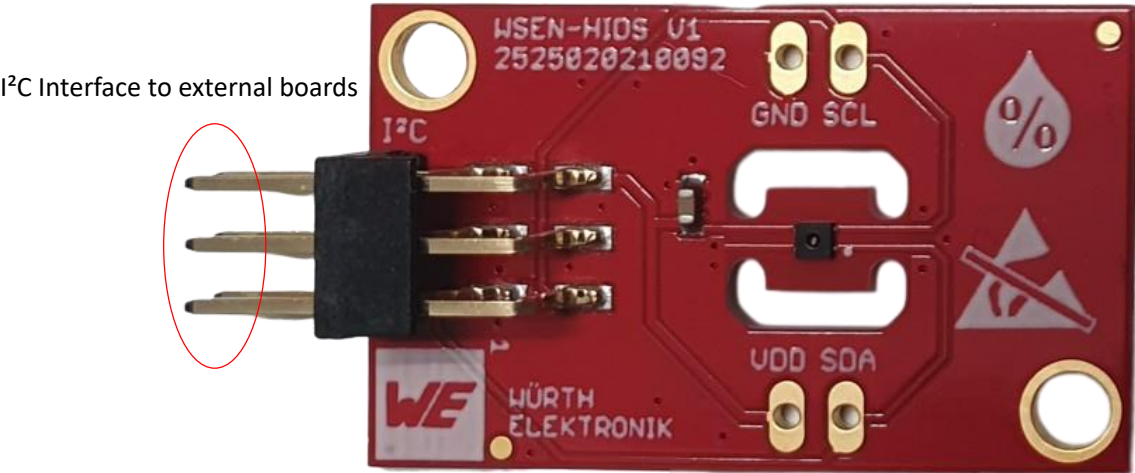
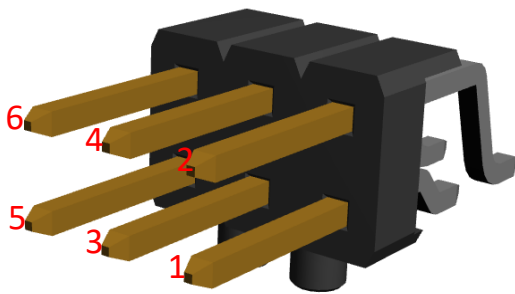


Figure 3: CON1 connection to the external boards



Pin No	I <sup>2</sup> C Pins (CON1)
1	GND
2	SCL
3	SDA
4	NC
5	NC
6	VDD

Table 2: CON1 connector to external boards



Please ensure to set pull-up resistors on the SDA and SCL bus lines on the master side.



### 2.1.2 Through-hole connection (P1 & P2)

The through-hole pin header connection gives direct access to each sensor pin. To use I<sup>2</sup>C via these through-hole connections, the SDA and SCL pins must be connected to VDD via pull-up resistors.

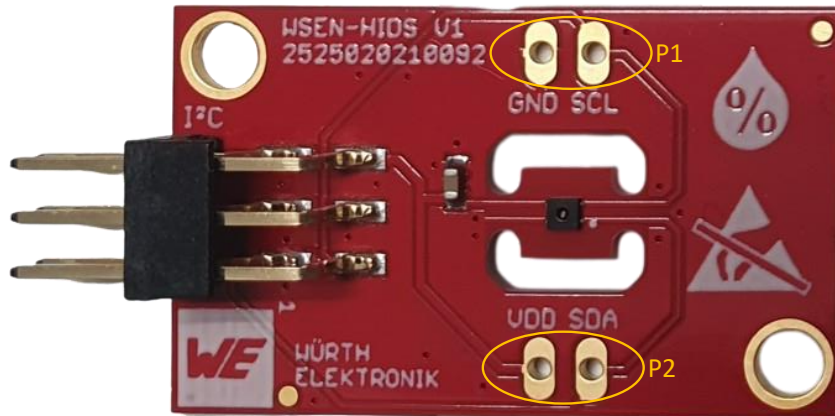


Figure 4: Pin header P1 & P2

P1	EV-Board pins	Description	Input/Output
1	<i>SCL</i>	I <sup>2</sup> C serial clock	Input
2	<i>GND</i>	Negative supply voltage	Supply

Table 3: P1 pin description

P2	EV-Board pins	Description	Input/Output
1	<i>SDA</i>	I <sup>2</sup> C serial data	Input/Output
2	<i>VDD</i>	Positive supply voltage	Supply

Table 4: P2 pin description

### 2.1.3 WSEN-ACCE filter cap connection

The EV-Board (Part number: 2525020210093) is designed to accommodate the WSEN-ACCE filter cap (part number: 2500060600000). The cap has four pins that align with openings on the PCB, allowing for secure attachment.

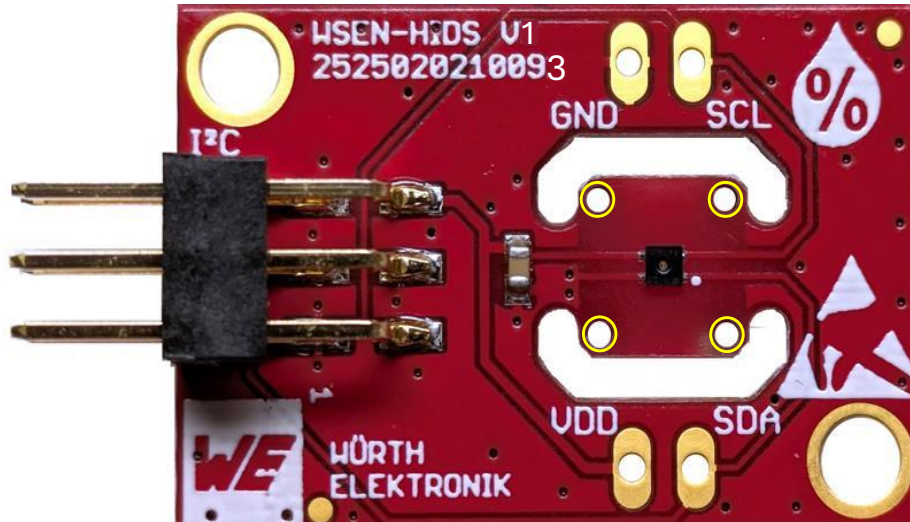


Figure 5: EV-Board (Part number: 2525020210093) with mounting hole pattern on the PCB to attach WSEN-ACCE filter cap (part number: 2500060600000).

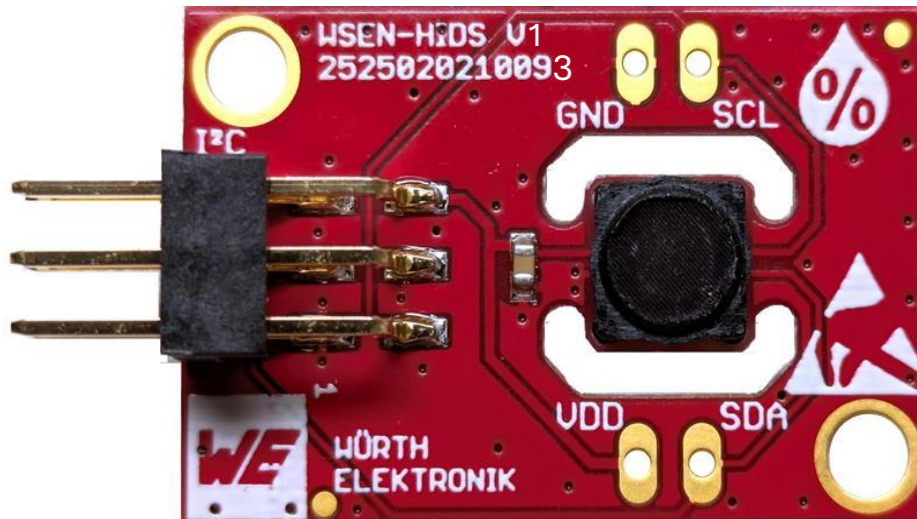


Figure 6: EV-Board (Part number: 2525020210093) with WSEN-ACCE filter cap (part number: 2500060600000) attached on it.



The mounting hole pattern is designed for press-fit mounting. This allows the user to easily mount and remove the cap as needed.

3 EV-Board

3.1 Schematic diagram 2525020210092

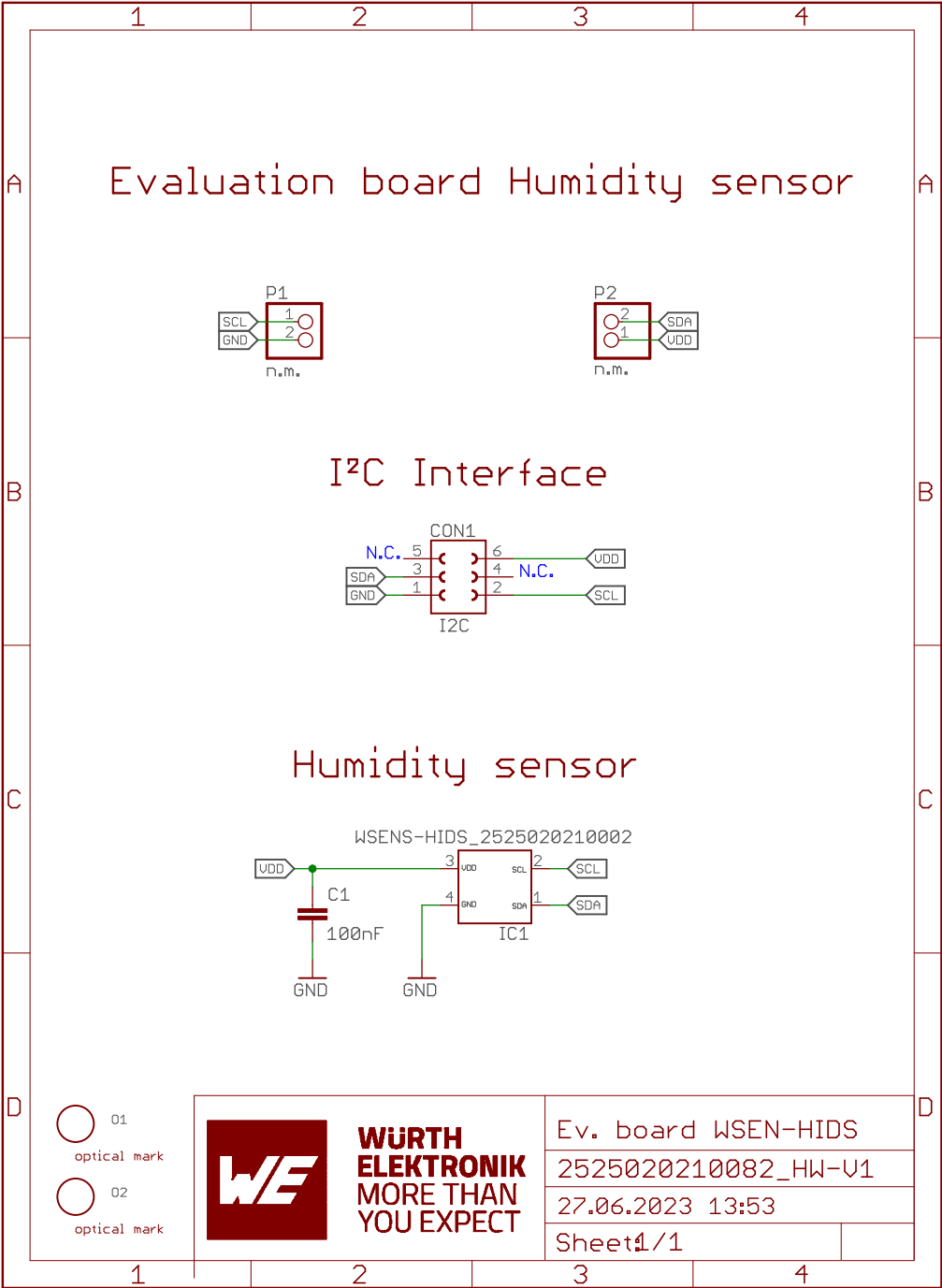


Figure 7: Schematic diagram

### 3.2 Layout 2525020210092

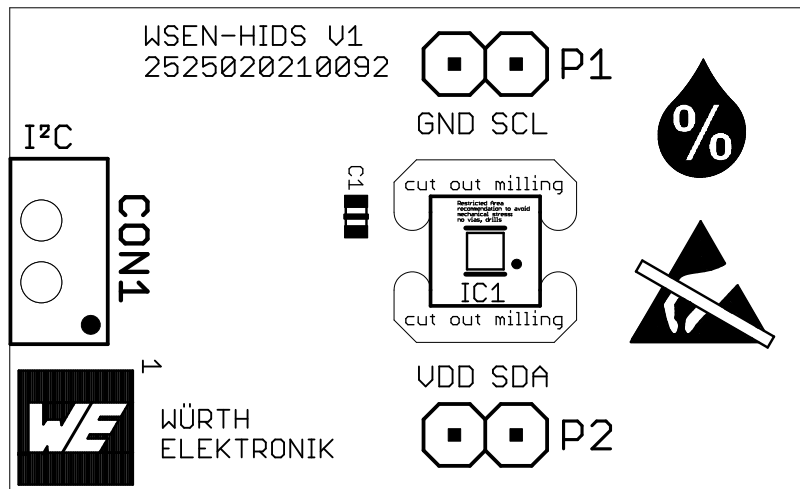


Figure 8: Assembly diagram

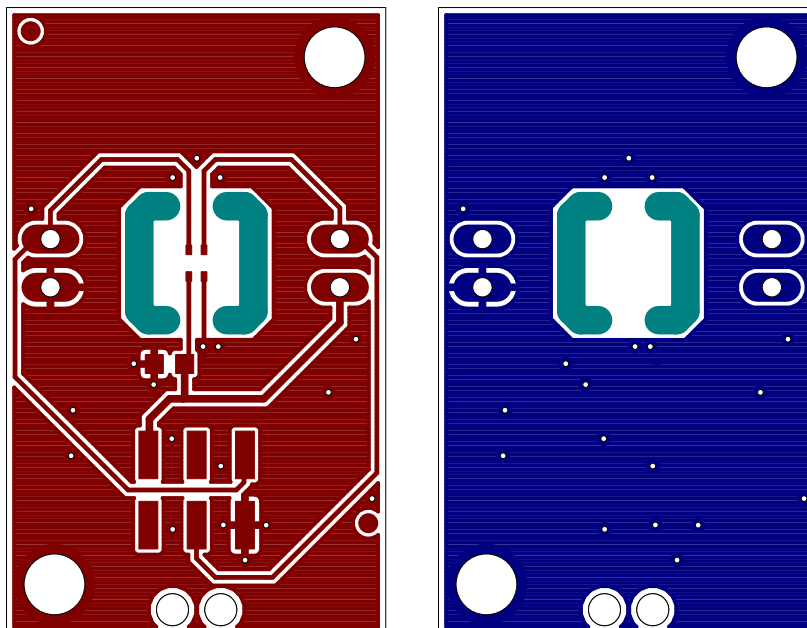


Figure 9: Top layer (left), bottom layer (right)



Please note that Layout 2525020210092 does not include the drill holes for the filter cap. The Layout 2525020210093 illustrates the configuration with the drill holes for filter cap. For more information about the filter cap, refer to the corresponding user manual of *WSEN- ACCE filter cap (2500060600000)*.

3.3 Schematic diagram 2525020210093

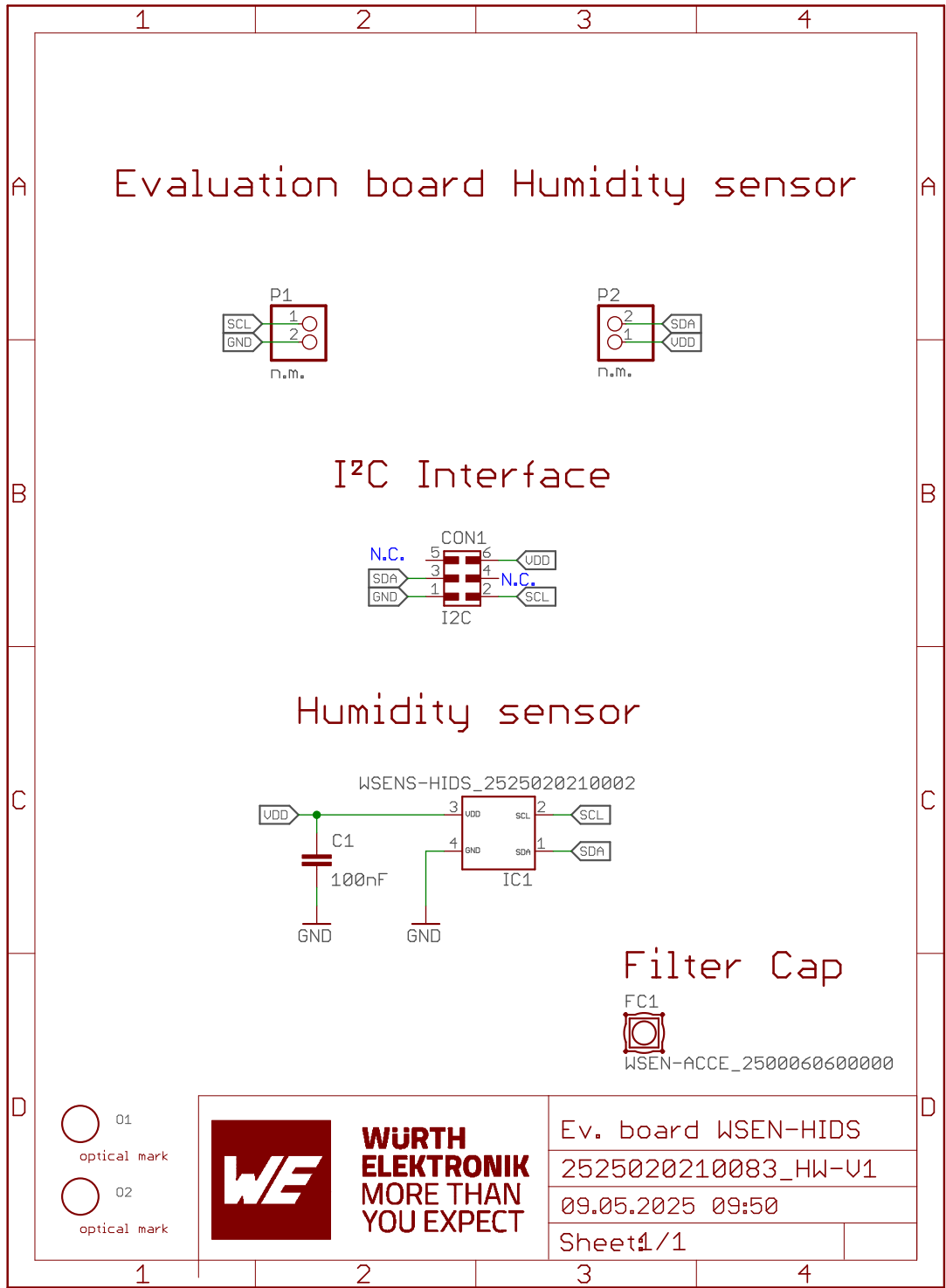


Figure 10: Schematic diagram

### 3.4 Layout 2525020210093

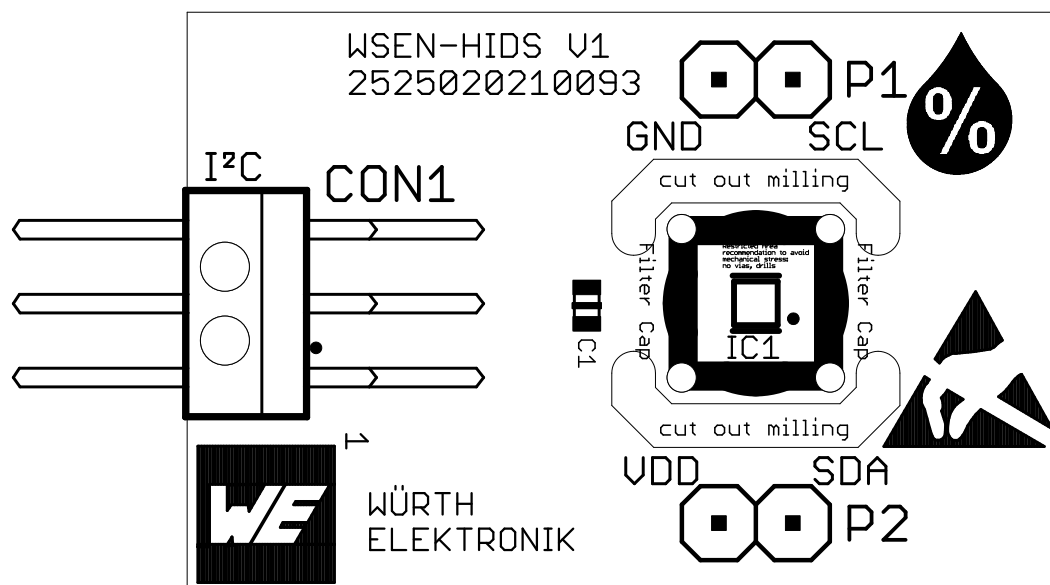


Figure 11: Assembly diagram

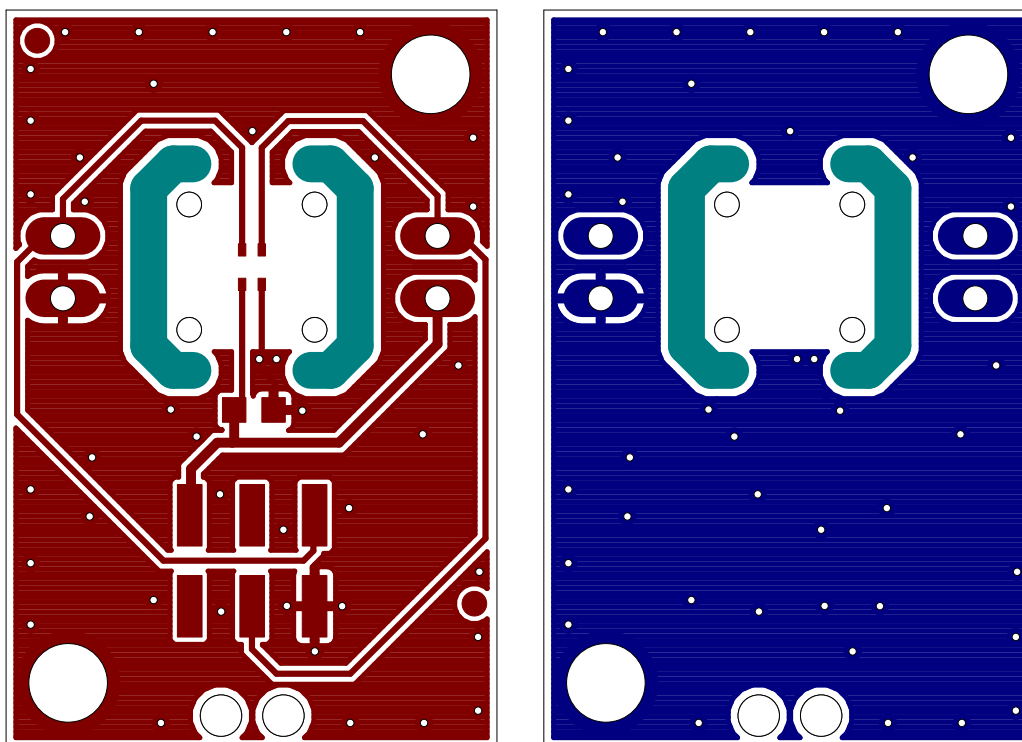


Figure 12: Top layer (left), bottom layer (right)

### 3.5 Bill of materials

Part	Value	Pack	Manufacturer	NR
C1	100nF	0603	Würth Elektronik eiSos	885012206095
CON1	2x3	SMT	Würth Elektronik eiSos	610106249121
IC1	WSENS-HIDS	SMT	Würth Elektronik eiSos	2525020210002
P1	n.m.	n.m.	n.m.	n.m.
P2	n.m.	n.m.	n.m.	n.m.

Table 5: Bill of materials for 2525020210092 and 2525020210093



You can order the parts P1 and P2 from our website and the order code is **61300211121**

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- The EVB must be fully assembled and all devices to be tested must be connected before voltage is applied to the EVB.
- The EVB should never be left unattended during operation.
- Capacitors must be completely discharged. The capacitors must be actively discharged using a suitable resistor.

#### Protection against static electricity

Use the unpackaged product only in ESD protected areas. Wear the ESD personal protective equipment prescribed for these areas. Ground all conductive components, including personnel, as prescribed in ESD protected areas. Ensure that the product is only used by trained personnel.

#### Purpose and use

The EVB is not a finished product and is not intended for general use by the consumer. The EVB is intended exclusively for use in the evaluation of WE components in the lab or in development environments by highly qualified technicians or engineers, familiar with the risks involved in handling electrical or mechanical components, systems and subsystems. The use of the EVB is your full and independent responsibility. The EVB is expressly not intended to be installed in a terminal device or to be part of a terminal device in whole or in part. WE reserves the right, at its own discretion, to make corrections, improvements, adjustments or other changes to the EVB or to discontinue the EVB. The EVB is not intended for use in devices and applications for which a higher safety and reliability standard is prescribed. It is also not approved for use in safety-relevant applications or where personal injury or fatal consequences must be expected in the event of failure.

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The EVB may only be operated within the specifications and environmental parameters recommended by WE, as described in the instructions for use. Exceeding the specified parameters (including, but not limited to, input and output voltage, current, power, and ambient conditions) may result in damage to property. If you have questions about these electrical parameters, please contact WE at ([regulatory-compliance@we-online.com](mailto:regulatory-compliance@we-online.com)) prior to connecting peripheral electronics (including the input voltage and intended loads). Any load outside a certain power range may lead to negative consequences, including, but not limited to, unintended or inaccurate evaluations or possibly permanent damage to the EVB or the electronics connected to it. Please ensure that the appropriate safety precautions are taken when working with the EVB, as serious injuries, including severe or even fatal injuries from electric shock or electric burns, may occur if you do not follow the appropriate safety precautions. Under no circumstances should the EVB be touched while live. When the EVB is connected to a power source, some of its components are electrically charged and/or have temperatures above 50 °C. This condition also applies for a short time after disconnecting from the supply voltage until the capacitors are completely discharged and hot components have cooled down. These components include connectors, linear regulators, switching transistors, heat sinks, resistors, diodes, inductors and other components, which can be identified from the documentation in the instructions for use. As with all electronic lab work, only qualified persons with knowledge of electronic performance evaluation, measurement and diagnostic tools, should use the EVB.

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