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# EVALUATION BOARD MANUAL

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## TEMPERATURE SENSOR IC

Evaluation board order code	Sensor order code
2521020222591	2521020222501

VERSION 1.0

FEBRUARY 19, 2020

## 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>	February 2020

## Abbreviations

Abbreviation	Description
I <sup>2</sup> C	Inter integrated circuit
n.m.	not mounted

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# 1 General description

## 1.1 Introduction

The evaluation board of the temperature sensor provides an opportunity to verify the sensor performance and develop a prototype using an external processor e.g. Amber Pi design kit (Part No: 2609017281001). It can be directly plugged to Amber Pi design kit using the mounted I<sup>2</sup>C interface pins. It can also be placed on a bread board using through hole pin header connections.

The temperature sensor IC (Part No: 2521020222501) is a 16-bit compact silicon based digital temperate sensor with an I<sup>2</sup>C interface. The sensor features programmable temperature thresholds and interrupt functionality.

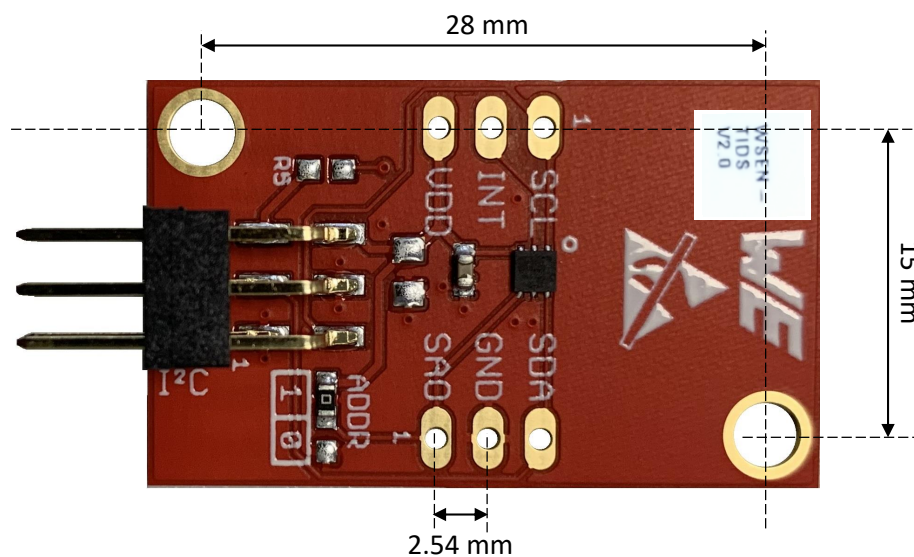


Figure 1: Evaluation board for the temperature sensor IC

## 1.2 Ordering information

WE order code	Dimensions	Description
2521020222501	2.0 x 2.0 x 0.5 mm	tape & reel packaging
2521020222581	2.0 x 2.0 x 0.5 mm	5 pcs cut tape packaging
2521020222591	33 x 20 mm	Evaluation board temperature sensor IC

Table 1: Ordering information

## 2 Functional description

The temperature sensor evaluation board supports the standard I<sup>2</sup>C communication interface.

- A positive supply voltage is applied to the sensor through *VDD* pin.
- The 7-bit I<sup>2</sup>C slave address of the temperature sensor is either 0111000b or 0111111b based on the *SAO* pin connection.



By default the 7-bit slave address of the temperature sensor on the evaluation board is 0111000b (0x38). i.e. *SAO* pin of the sensor is connected to *VDD* using 0Ω resistor ADDR.



The 7-bit slave address of the temperature sensor can be changed to 0111111b (0x3F) by removing 0Ω resistor ADDR from '1' part and mounting it on the '0' part of the evaluation board. i.e. *SAO* pin is connected to *GND* using 0Ω resistor ADDR.

Pin No.	Name	Function	I/O	Comments
1	<i>SCL</i>	I <sup>2</sup> C serial clock	Input	
2	<i>INT</i>	Interrupt	Output	Do not connect if not used
3	<i>VDD</i>	Positive supply voltage	Supply	
4	<i>SAO</i>	I <sup>2</sup> C device address selection	Input	High: device address is 0111000b Low: device address is 0111111b
5	<i>GND</i>	Negative supply voltage	Supply	
6	<i>SDA</i>	I <sup>2</sup> C serial data	Input/Output	

Table 2: Pin description



Please refer to the data sheet of the temperature sensor (Order code: 2521020222501) for more information about the electrical properties.

## 2.1 Evaluation board in operation

### 2.1.1 Pin header connection

I<sup>2</sup>C interface to external board  
i.e. Amber Pi design kit

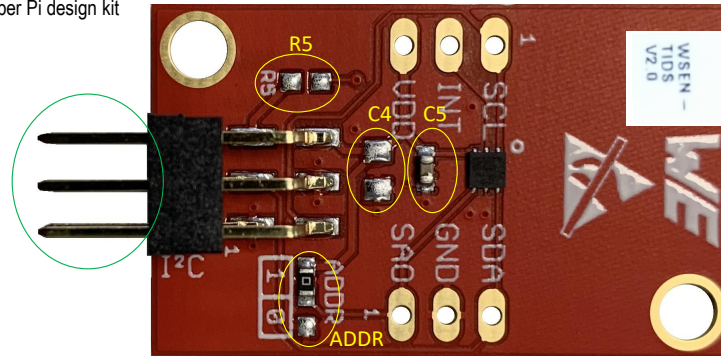
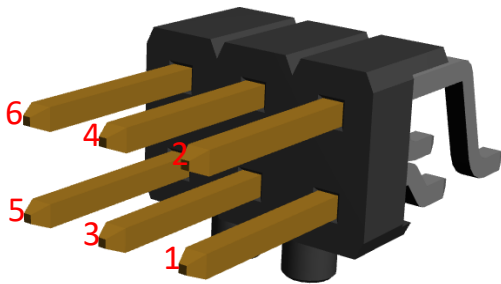


Figure 2: Pin header connection to the external boards. e.g. Amber Pi design kit



No	Description
1	<i>GND</i>
2	<i>SCL</i>
3	<i>SDA</i>
4	<i>GND</i>
5	<i>INT</i>
6	<i>VDD</i>

Table 3: Pin header to the external boards



The pin configuration of the mounted pin header is same as other sensor evaluation boards from Würth Elektronik eiSos.



When the evaluation board is connected to Amber Pi design kit using I<sup>2</sup>C interface pins, INT interrupt pin function will not be available.

Component	Description
R5	Open. Connect a $0\Omega$ resistor to enable the interrupt function on INT pin.
C4	Open. Optionl $10\ \mu\text{F}$ decoupling capacitor can be connected in parallel to the C5.
ADDR	Defines 7-bit slave address for I <sup>2</sup> C communication. Slave address of the sensor is 0111000b (0x38). SAO is connected to VDD.

Table 4: Functionality of the resistors and capacitors on the evaluation board

### 2.1.2 Through hole connection

Through hole pin header connection gives direct access to each sensor pin. *SDA*, *SCL* and *INT* pins must be connected to *VDD* via pull-up resistors. *SAO* pin connection to either *VDD* or *GND* is also necessary in order to define an I<sup>2</sup>C slave address.

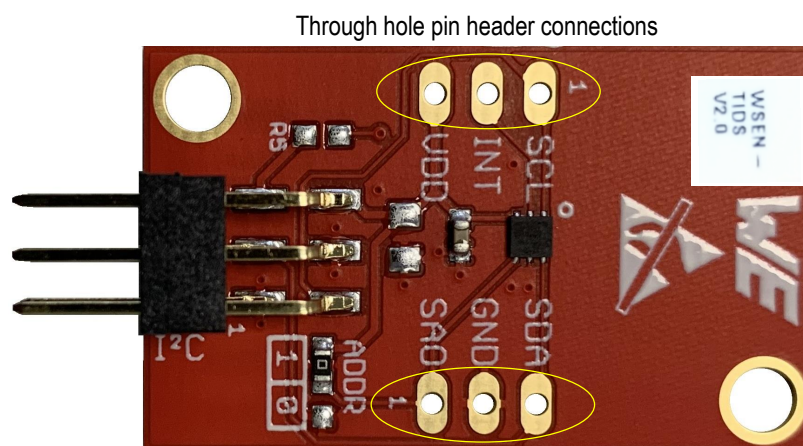


Figure 3: Through hole connection



Please refer to the application circuit described in the user manual of the sensor (Order code: 2521020222501) for more information.



### 3 Evaluation board

#### 3.1 Schematic diagram

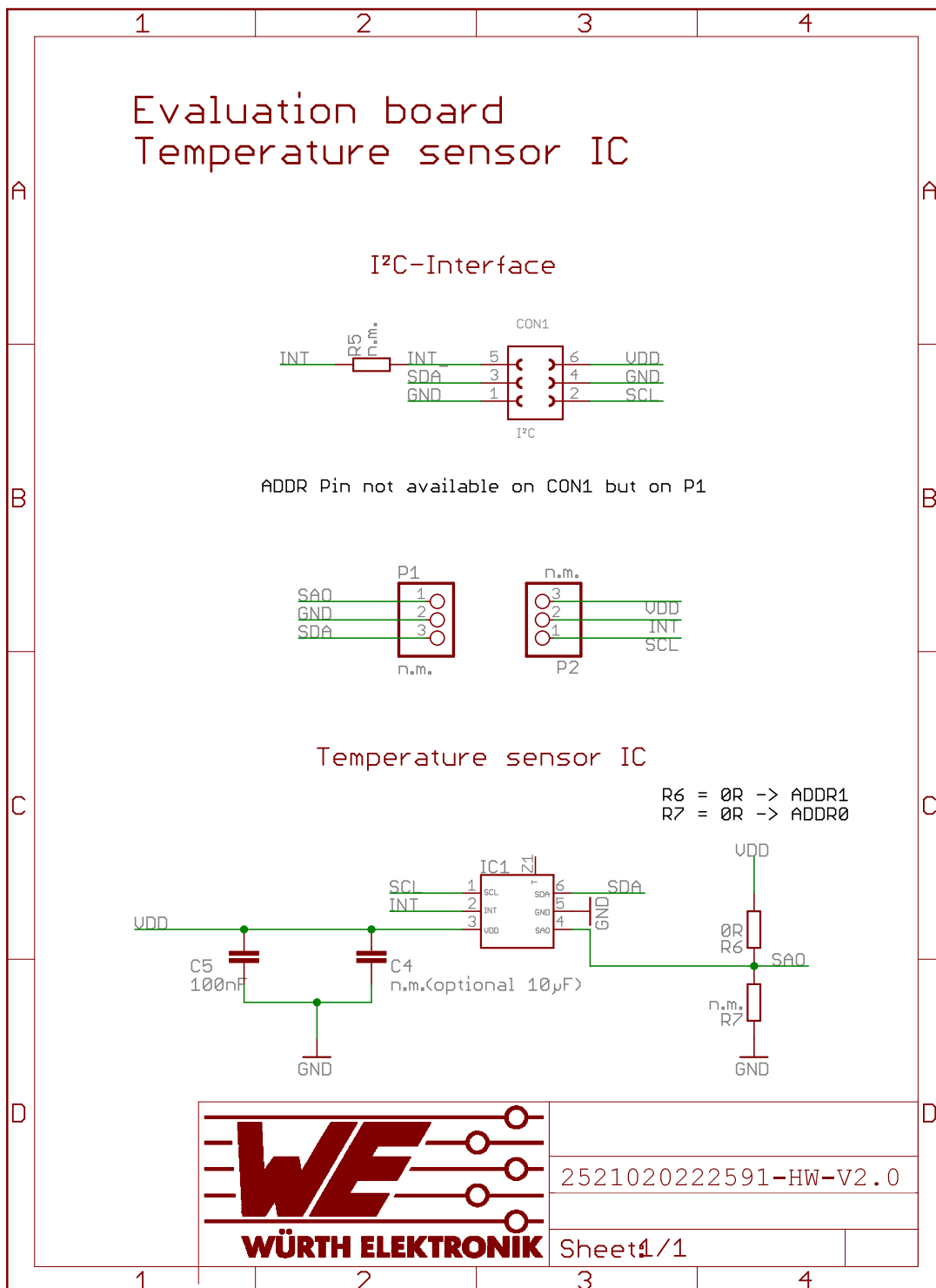


Figure 4: Schematic diagram

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