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# EVALUATION BOARD MANUAL

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## 3-AXIS ACCELERATION SENSOR

Evaluation board order code	Sensor order code
2533203301691	2533020201601

VERSION 1.1

APRIL 23, 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>	June 2019
1.1	1.0	<ul style="list-style-type: none"><li>• Layout of schematic diagram updated</li></ul>	April 2020

## Abbreviations

Abbreviation	Description
I <sup>2</sup> C	Inter integrated circuit
MEMS	Micro electro mechanical system
LSB	Least significant bit

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# 1 General description

## 1.1 Introduction

The evaluation board of the acceleration 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 acceleration sensor (Part No: 2533020201601) is a 14-bit digital ultra-low-power and high-performance three-axis linear accelerometer with an I<sup>2</sup>C digital interface.

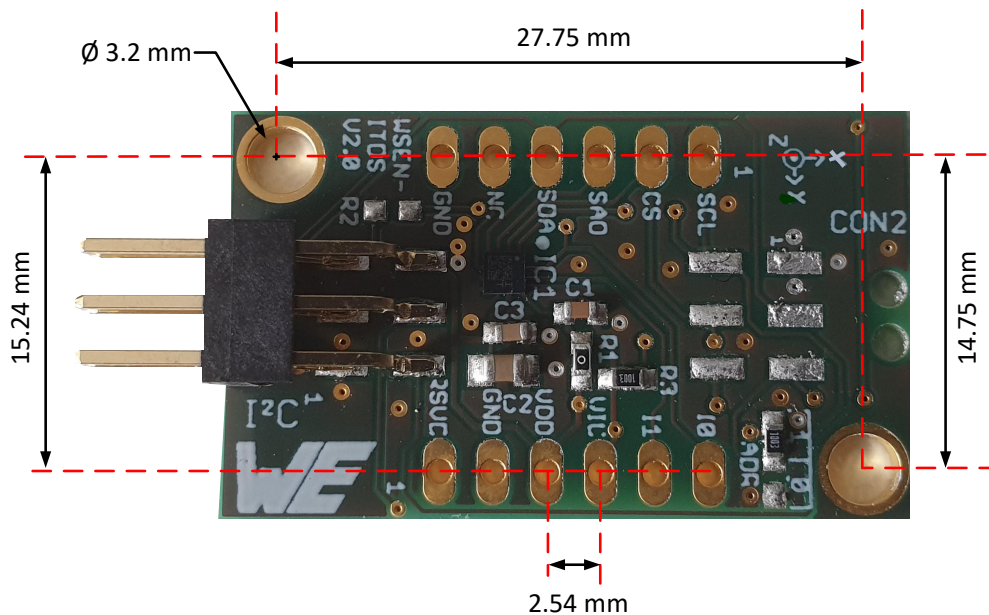


Figure 1: Evaluation board for the acceleration sensor

## 2 Functional description

The acceleration 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 and I/O supply voltage for digital interface through *VDD\_IO* pin. The *VDD* and *VDD\_IO* pins on the board are connected together using 0Ω resistor R1.
- The I<sup>2</sup>C communication is enabled by connecting *CS* pin to *VDD\_IO*. The *CS* pin is connected to *VDD\_IO* using 100kΩ resistor R3.
- The 7-bit slave address of the acceleration sensor is 001100xb. LSB of the 7-bit slave address can be modified using the *SAO* pin.



By default the 7-bit slave address of the acceleration sensor on the evaluation board is 0011001b (0x19). i.e. *SAO* pin of the sensor is connected to *VDD\_IO* using 100kΩ resistor ADR.



The 7-bit slave address of the acceleration sensor can be changed to 0011000b (0x18) by removing 100kΩ resistor ADR from '1' part and mounting it on the '0' part of the evaluation board. i.e. *SAO* pin is connected to *GND* using 100kΩ resistor ADR.

Pin No.	Evaluation board pins	Sensor pins	Description	Input/Output
1	<i>SCL</i>	<i>SCL</i>	I <sup>2</sup> C serial clock	Input
2	<i>CS</i>	<i>CS</i>	I <sup>2</sup> C enable/disable	Input
3	<i>SAO</i>	<i>SAO</i>	I <sup>2</sup> C device address selection	Input
4	<i>SDA</i>	<i>SDA</i>	I <sup>2</sup> C serial data	Input/Output
5	<i>NC</i>	<i>NC</i>	No connection	-
6	<i>GND</i>	<i>GND</i>	Negative supply voltage	Supply
7	<i>RSVD</i>	<i>RSVD</i>	Reserved, connect to GND	Input
8	<i>GND</i>	<i>GND</i>	Negative supply voltage	Supply
9	<i>VDD</i>	<i>VDD</i>	Positive supply voltage	Supply
10	<i>VIO</i>	<i>VDD_IO</i>	Positive supply voltage for I/O pins	Supply
11	<i>I1</i>	<i>INT_1</i>	Interrupt pin 1	Input/Output
12	<i>I0</i>	<i>INT_0</i>	Interrupt pin 0	Output

Table 1: Pin description



Please refer to the data sheet of the acceleration sensor (Part No: 2533020201601) 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 boards  
e.g. Amber Pi design kit

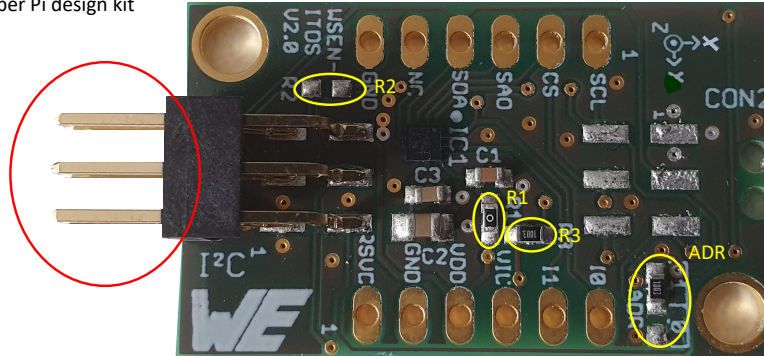
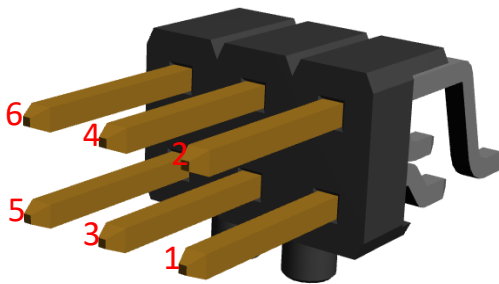


Figure 2: Pin header connection to the external boards. e.g. Amber Pi design kit



No	Description
1	<i>GND</i>
2	<i>SCL</i>
3	<i>SDA</i>
4	<i>INT_1</i>
5	<i>INT_0</i>
6	<i>VDD</i>

Table 2: Pin header to external boards



When the evaluation board is connected to Amber Pi design kit using I<sup>2</sup>C interface pins, INT\_0 and INT\_1 interrupt pin functions will not be available.

Resistor	Description
R1	VDD and VDD_IO pins are connected together
R2	Open. It should be connected if the interrupt function on INT_0 pin is necessary
R3	I <sup>2</sup> C enabled. CS is connected to VDD_IO
ADR	I <sup>2</sup> C address of the sensor is 0011001b. SAO is connected to the VDD_IO

Table 3: Functionality of resistors on the evaluation board

### 2.1.2 Through hole connection

Through hole pin header connections

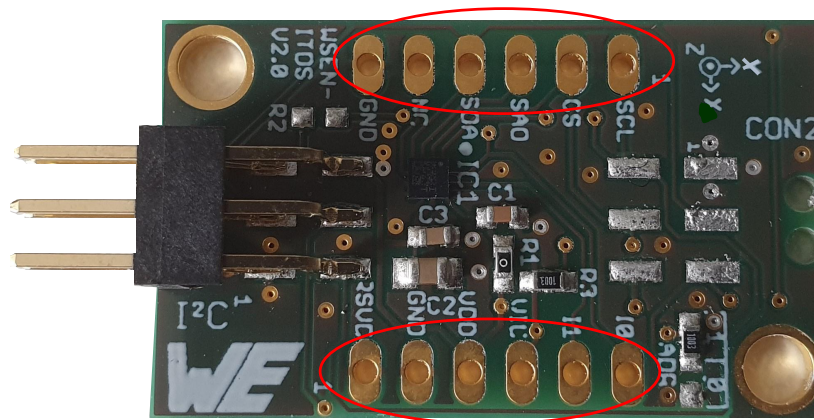


Figure 3: Through hole connection



Please refer to Table 1 for the pin description of the evaluation board.



Check if necessary for your configuration that R1, R3 and ADR resistors have to be removed before connecting the evaluation board to a processor.



### 3 Evaluation board

#### 3.1 Schematic diagram

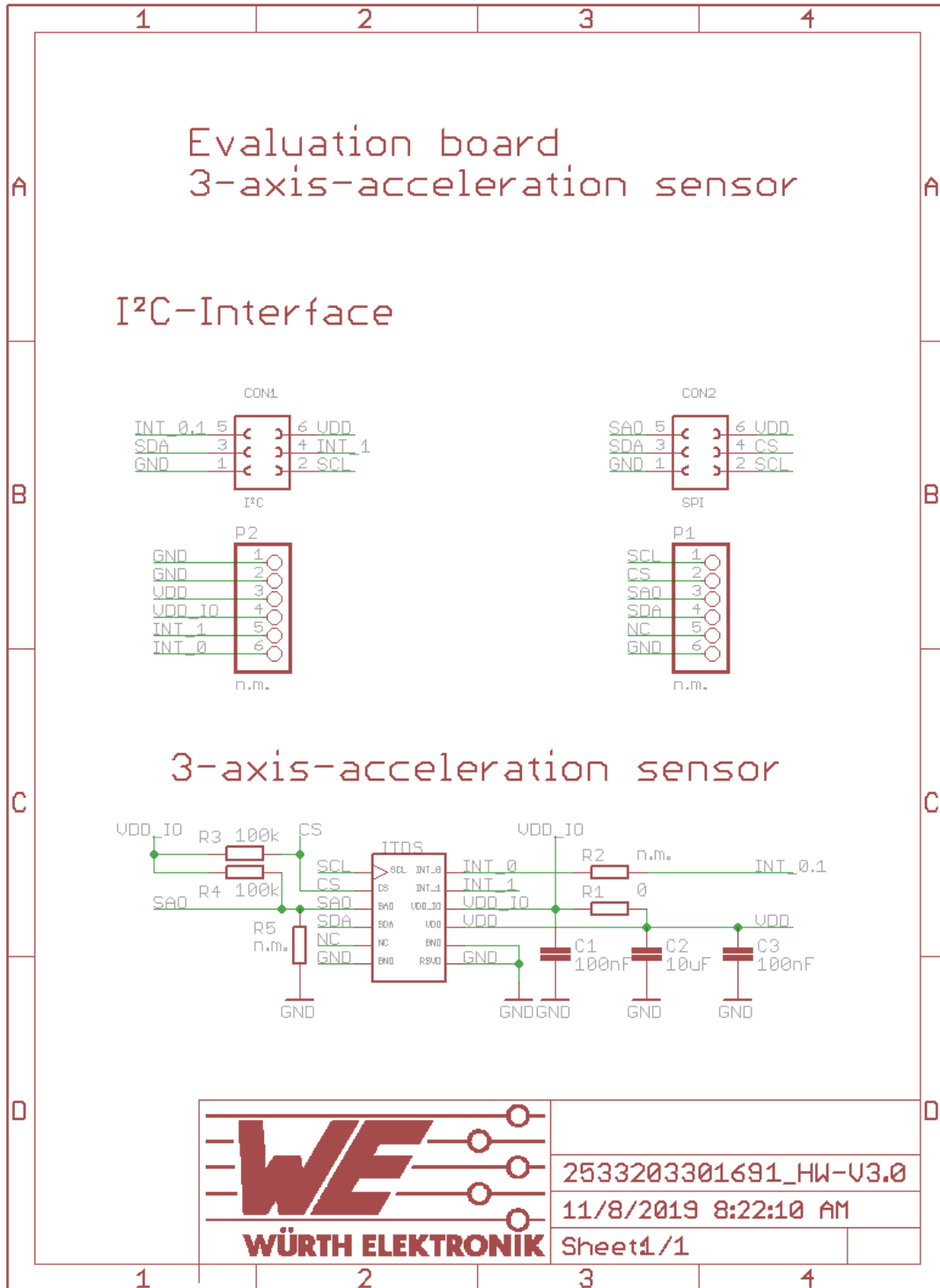


Figure 4: Schematic diagram

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