Eval Kit Manual

AS6200

Adapter Board

AS6200-WL_EK_AB

Content Guide

1 Introduction

The AS6200 adapter board is a small PCB allowing a simple and quick evaluation of the AS6200 digital temperature sensor without the need to design a custom PCB. This small form factor board is fully assembled with the AS6200 temperature sensor and its necessary external components.

1.1 Kit Content

This kit contains following material listed in

Table 1: Kit **Content**.

Figure 1: adapter board

Pos.	Item	Comment
1	AS6200-EK-AB	Eval kit adapter board

Table 1: Kit Content

2 Getting Started

The AS6200 adapter board is ideal for rapid setup of a digital temperature sensor. To get started connect the board to your microcontroller configuration as described in *Figure 3: I²C connection.* Add a command in your source code to request two bytes from the selected I²C address. Finally convert the returned data as described in chapter *4.2 Temperature Register* to get the actual temperature value.

3 Hardware Description

The P1 connector does provide all relevant signals which can be easily wired to a microcontroller and power supplied with a voltage of 1.8 to 3.6V

Pin	Symbol	Description	Info
1	SCL	I²C clock	Use R1 if pull-up is required
2	SDA	I²C data	Use R2 if pull-up is required
3	GND	Ground	
4	VDD	Power supply	1,8 – 3,6 V
5	IRQ	Digital output pin	Alert interrupt output

Table 2 Adapter board pin-out

3.1 Hardware Architecture

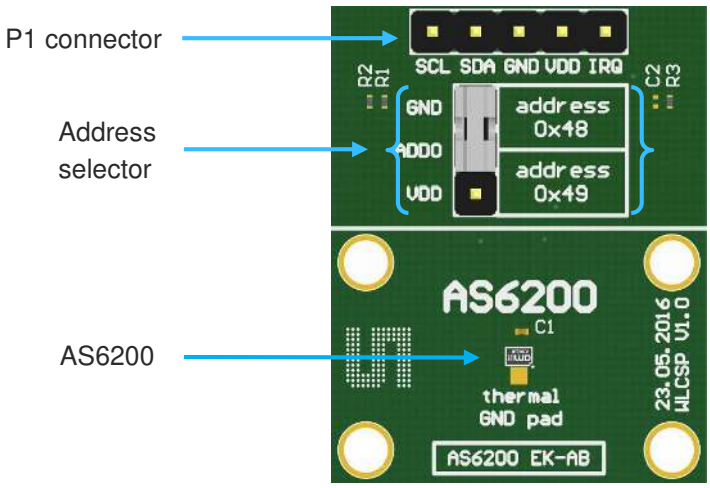


Figure 2: AS6200 adapter board

R1, R2 and R3 are pull-up resistors for the I²C interface and the Alert pin.

Depending on the application, it is recommended to either populate the decoupling capacitor C1 or C2.

3.2 AS6200 Configuration

With the address selector it is possible to choose the I²C address of the device The included jumper is an easy way of setting the I²C address of the sensor. The address selector must not be left open.

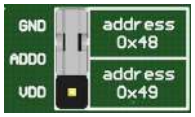
	Address Selector	Device Address	
	GND	100 1000	0x48
	VDD	100 1001	0x49

Table 3: I²C address

3.3 Power Supply and Connections

The PCB has to be connected to an external microcontroller. P1 is populated with a 1x5 pin header and is required for power supply as well as I²C communication. In addition to that it can be used to monitor the interrupt status via pin 5 (IRQ).

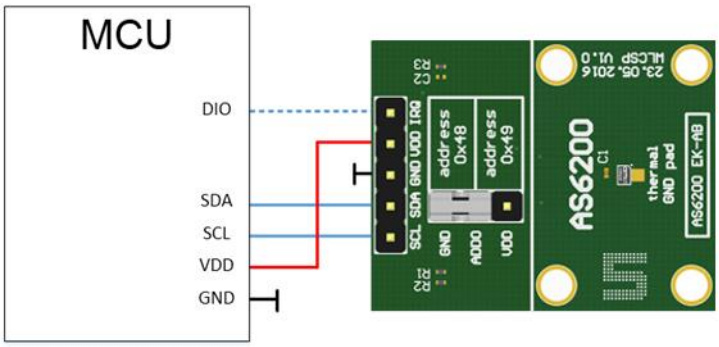
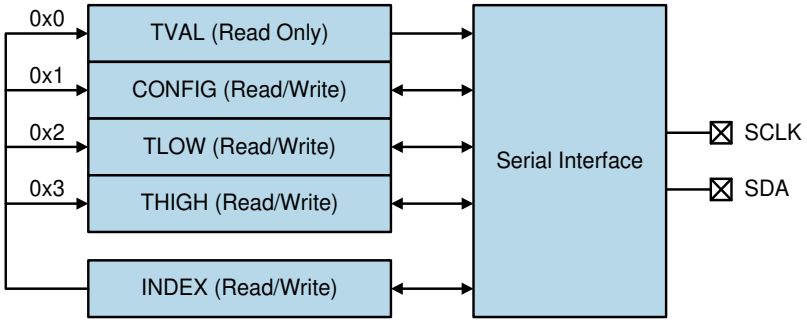


Figure 3: I²C connection

4 Software Description

The AS6200 has 4 data registers. With the use of the index register, it is possible to address the specific data register. When powered up the address register is set to 0x0.



For additional configuration settings the Config register (0x1) has to be addressed. Please refer the data sheet for details.

Address	Symbol	Register	Description
0x0	TVAL	Temperature Register	Contains the temperature value
0x1	CONFIG	Configuration Register	Configuration settings of the temperature sensor
0x2	TLOW	T_{LOW} Register	Low temperature threshold value
0x3	THIGH	T_{HIGH} Register	High temperature threshold value

Table 4: Configuration Register

4.1 Index Register

The index register contains 8 bit, but only D0 and D1 are used.

Bit	D7	D6	D5	D4	D3	D2	D1	D0
Value	0	0	0	0	0	0	Address Bits	

Table 5: Index Register

4.2 Temperature Register

D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	T0	0	0	0	0
MSB Byte								**LSB Byte**							

Table 6: Temperature Register

The temperature register contains the digitally converted temperature value. It consists of 2 byte and can be converted according to the following formula:

Positive values= |Value| / LSB

Negative values= Complement(|Value| / LSB) + 1

Example +75°C

$75°C \,/\, 0.0625°C = 1200 = Binary\ 0100\ 1011\ 0000 = Hex\ 4B0$

Example -40°C

$\overline{|-40°C|} \,/\, 0.0625°C + 1 = \overline{640} + 1 = Binary\ \overline{0010\ 1000\ 0000} + 1 = 1101\ 0111\ 1111 + 1 = 1101\ 10000\ 0000 = Hex\ D80$

5 Schematics, Layers and BOM

The schematics, layout and BOM of the adapter board are shown below for reference.

5.1 Schematics

The schematics of the board is shown below in *Figure 4: Schematics.*

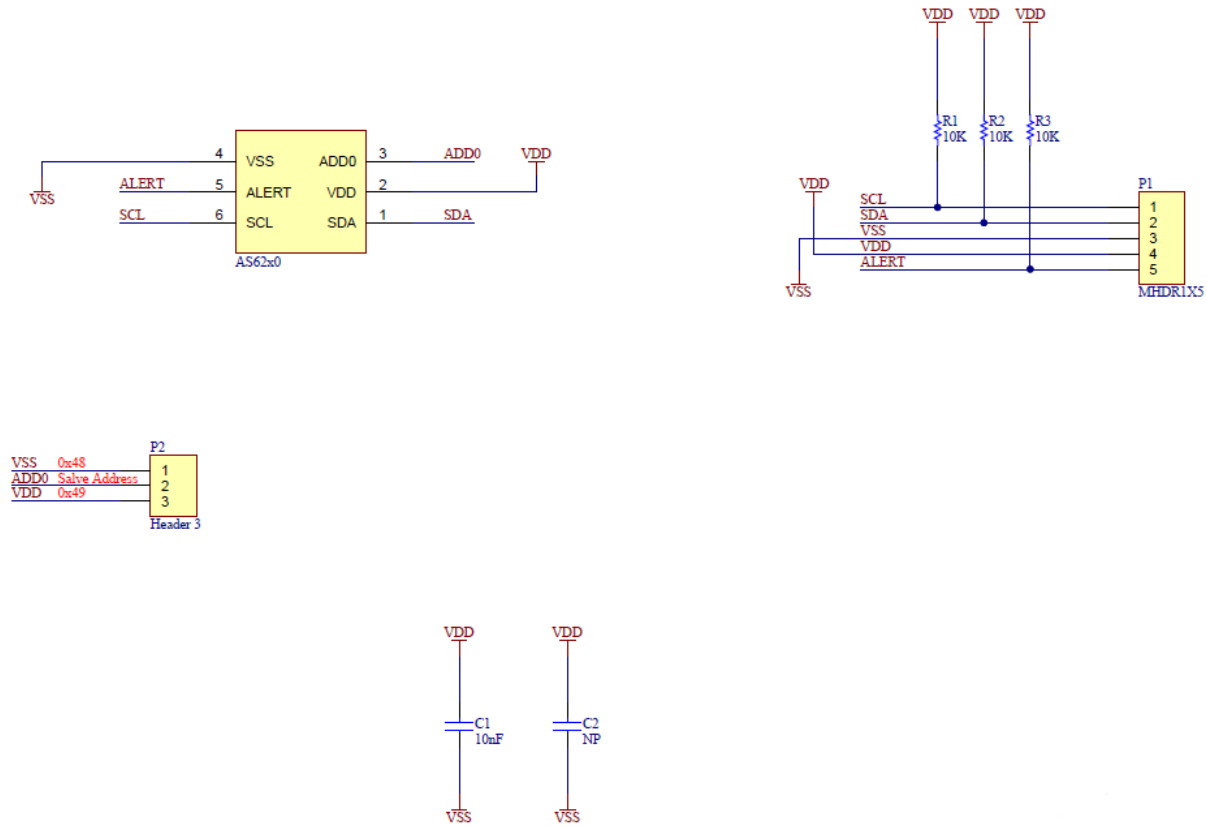


Figure 4: Schematics

5.2 Layout and Board Dimensions

The PCB layout is shown below in *Figure 5: Top Layer* and *Figure 6: Bottom Layer*.

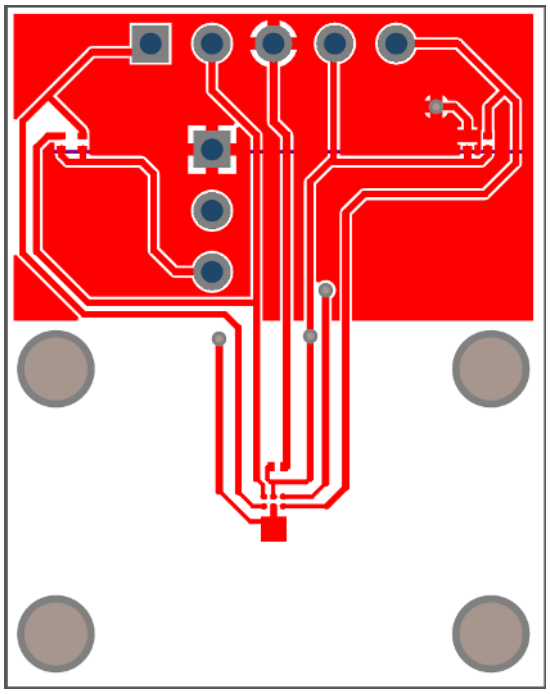


Figure 5: Top Layer

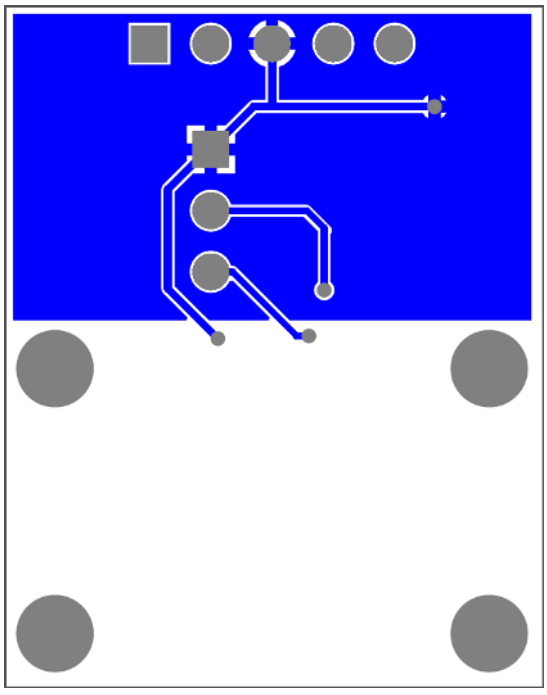


Figure 6: Bottom Layer

The board dimensions are shown below in *Figure 7: Dimensions.*

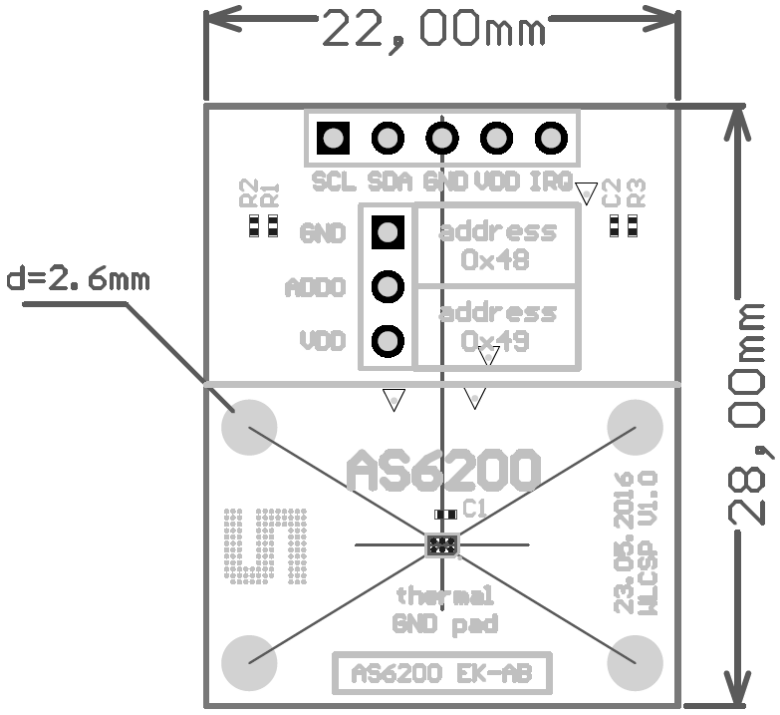


Figure 7: Dimensions

5.3 Bill of Materials

The BOM of the board is shown below in *Table 7: BOM*.

Position	Name	Value
1	R7	NP
2	R6	NP
3	R5	NP
4	R4	NP
5	R3	10K
6	R2	10K
7	R1	10K
8	P1	Header 5
9	C2	NP
10	C1	10nF
11	AS6200	AS6200 WLCSP

Table 7: BOM

Ordering & Contact Information

Ordering Code	Description
AS6200-WL_EK_AB	AS6200 Eval Kit Adapter Board

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7 Revision Information

Changes from previous version to current revision 1-00 (2016-Jun-01)	Page
Initial version 1-00	

Note: Page numbers for the previous version may differ from page numbers in the current revision.
Correction of typographical errors is not explicitly mentioned.