AS8579 Adapter Board

User Manual (HW/SW)

AS8579-SS_EK_AB

v1-00 • 2021-Apr-16
# Content Guide

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1 Introduction

This manual explains how to use the AS8579-SS_EK_AB hardware. The Hardware is designed to test and evaluate the features of AS8579 capacitive sensor. The AS8579 is a sensor, which measures the capacitive value by separately measuring the 10-bit Information (accumulated to 14-bit) of I and Q. This 14-bit information provides the capacitance of the application. The I and Q data can be read over a standard SPI interface.

For first setting up, please see application note: AS8579_SPI_Configuration_AN001003_1-00.

1.1 Kit Content

Figure 1:
AS8579 Adapter Board Kit Content
1.2 Ordering Information

<table>
<thead>
<tr>
<th>Ordering Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS8579-SS_EK_AB</td>
<td>AS8579 Adapter Board</td>
</tr>
</tbody>
</table>
2 Board Description

The PCB can be connected via standard SPI to a microcontroller. The Production-Programmer from SD4Y and the ams I&P-Box are also recommended tools for communication/programming interface.

If you want to connect the I&P box to the Adapter Board, a level shifter is needed (the I&P Box works with 3.3 V voltage levels).

The PCB is equipped with all necessary peripheral components for easy evaluation.

Figure 2:
AS8579 Adapter Board

Figure 3:
BOM

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U1</td>
<td>Capacitive sensor AS8579</td>
</tr>
<tr>
<td>C1</td>
<td>Capacitor 100 nF</td>
</tr>
<tr>
<td>C2</td>
<td>Capacitor 1 µF</td>
</tr>
<tr>
<td>X1</td>
<td>Oscillator 48 MHz</td>
</tr>
</tbody>
</table>
2.1 Detailed Description

Figure 4:
AS8579 Adapter Board Overview

Figure 5:
Description

<table>
<thead>
<tr>
<th>Components</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>Pin 5 V supply and ground</td>
</tr>
<tr>
<td>SPI Pins</td>
<td>Communication and Programming Interface</td>
</tr>
<tr>
<td>SEN Lines</td>
<td>Sensing interface</td>
</tr>
<tr>
<td>VAR/ FIX SEN</td>
<td>Pins for cable and PCB shielding</td>
</tr>
</tbody>
</table>
| Oscillator       | Oscillator for clock generation of system clock frequency input
|                 | Settings: EDIV=0000b (default value) -> CLK_E divider is 12
|                 | and resulting system clock is 4 Mz                                          |
| AS8579           | Capacitive sensor                                                          |
| Bypass Caps      | Recommended decoupling capacitors                                           |
2.2 Pinout

Figure 6:
AS8579 Adapter Board Pinout
### Figure 7: Pinout

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1-1</td>
<td>SEN0</td>
<td></td>
</tr>
<tr>
<td>P1-2</td>
<td>SEN1</td>
<td></td>
</tr>
<tr>
<td>P1-3</td>
<td>SEN2</td>
<td></td>
</tr>
<tr>
<td>P1-4</td>
<td>SEN3</td>
<td></td>
</tr>
<tr>
<td>P1-5</td>
<td>SEN4</td>
<td></td>
</tr>
<tr>
<td>P1-6</td>
<td>SEN5</td>
<td></td>
</tr>
<tr>
<td>P1-7</td>
<td>SEN6</td>
<td></td>
</tr>
<tr>
<td>P1-8</td>
<td>SEN7</td>
<td></td>
</tr>
<tr>
<td>P1-9</td>
<td>5V</td>
<td>5 V supply</td>
</tr>
<tr>
<td>P1-10</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>P1-11</td>
<td>CSn</td>
<td>SPI – Chip select</td>
</tr>
<tr>
<td>P1-12</td>
<td>MOSI</td>
<td>SPI – Master out slave in</td>
</tr>
<tr>
<td>P1-13</td>
<td>CLK</td>
<td>SPI – Clock</td>
</tr>
<tr>
<td>P1-14</td>
<td>MISO</td>
<td>SPI – Master in slave out</td>
</tr>
<tr>
<td>P1-15</td>
<td>SEN9</td>
<td>Sensing Lines (8-9)</td>
</tr>
<tr>
<td>P1-16</td>
<td>SEN8</td>
<td></td>
</tr>
<tr>
<td>P2-1</td>
<td>FIX_SEN</td>
<td>PCB shielding driver</td>
</tr>
<tr>
<td>P2-2</td>
<td>VAR_SEN</td>
<td>Cable shielding driver</td>
</tr>
</tbody>
</table>
3 Hardware

3.1 Schematic

Figure 8: Schematic

![Schematic Diagram]

- **P1**
  - SEN0
  - SEN1
  - SEN2
  - SEN3
  - SEN4
  - SEN5
  - SEN6
  - SEN7

- **P2**
  - Header 8X2A

- **Header 8X2A**
  - FIXSEN
  - VARSEN

- **Enable Control**
  - GND

- **48MHz_oscillator**
  - CSn
  - MOSI
  - CLK
  - DIN

- **AS8579**
  - ECLK
  - TEST_ENABLE
  - VARSEN
  - FIXSEN
  - CS
  - DIN
  - SCLK
  - VDD1
  - VDD2
  - MOSI
  - MISO

- **C1** 100nF

- **C2** 1µF

- **VDD**
- **OUT**

- **X1**
  - 5V
  - GND

- **U1**
  - REG1
  - REG2
  - VSS1
  - VSS2
  - SEN7
  - SEN8
  - SEN9

- **Size**
  - Date
  - Project Title
  - Revision
  - Sheet of Originator

- **SEN0** 1
  - **SEN1** 2
  - **SEN2** 3
  - **SEN3** 4
  - **SEN4** 5
  - **SEN5** 6
  - **SEN6** 7
  - **SEN7** 8

- **SEN8** 9
  - **SEN9** 10

- **SENS**
  - VARSEN
  - FIXSEN

- **5V**

- **GND**

3.2 Layout

Figure 9: PCB Layout

(1) All dimensions in mm.
4 Revision Information

<table>
<thead>
<tr>
<th>Changes from previous version to current revision v1-00</th>
<th>Page</th>
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<tr>
<td>Initial production version</td>
<td>all</td>
</tr>
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- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.
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