ams

AS726x-iSPI Evaluation Kit User Guide

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Content Guide

1 Introduction

AS726x-iSPI Evaluation Kit provides a platform to evaluate ams AS726x products with AS726x Spectral Sensing – iSPI software running on Windows based personal computer. This user guide describes the features and functions of AS726x-iSPI evaluation kit.

1.1 Kit Content

The following items are delivered with this Demo Kit.
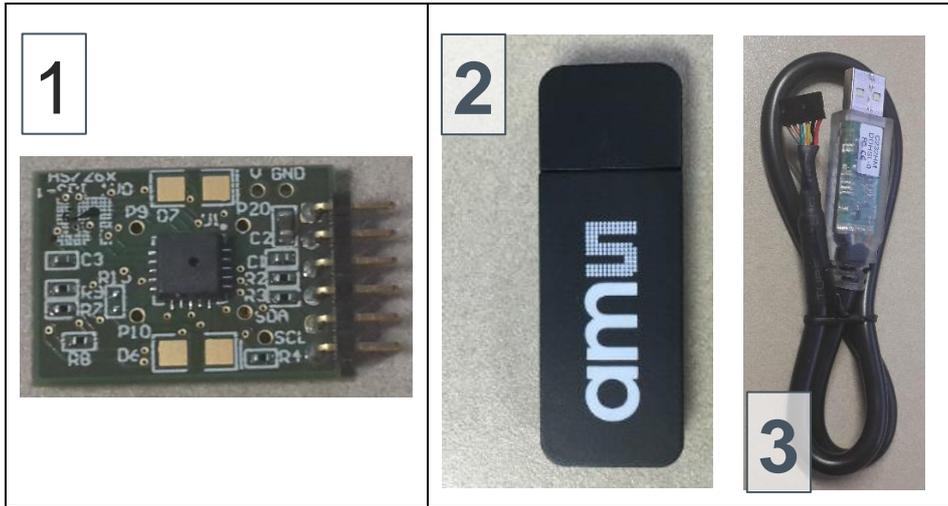
Pos.	Item	Comment
1	AS726x-iSPI Board	Evaluation Board
2	USB Memory Stick	Documents and Software
3	Cable	FTDI USB-MPSSE Cable

Figure 1. Kit Content

1.2 Connection
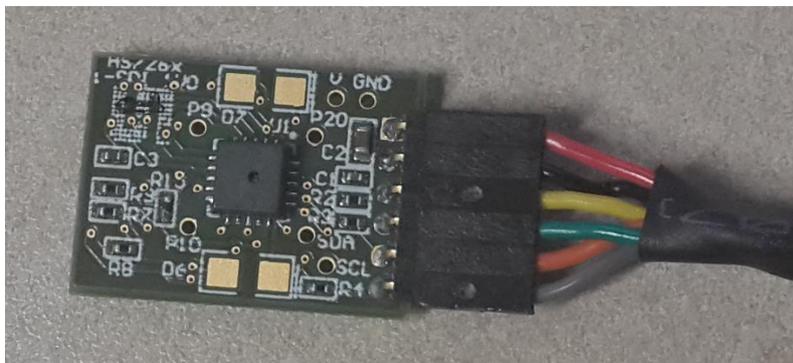
Figure 2. AS726x-iSPI and Cable Connection

J2's Pin 1 (the pin with square pad) needs to be connected to Red wire of the cable.

2   Getting Started

The evaluation kit requires one time installation of FTDI CDM Driver for the USB-MPSSE cable if it is not already installed on the computer. The installation file can be found in the USB Memory Stick. If there is an issue about the installations, please refer to www.ftdichip.com for more information.

The AS726x Spectral Sensing – iSPI software does not need extra installation. Please copy the following files to any folder you would like to work with and run the .exe file to start the GUI.

#	File	Comment
1	AS726x_Spectral_Sensing_iSPI_GUI.exe	Excutable file
2	FTD2XX_NET.dll	DLL file

Figure 3. AS726x Spectral Sensing –iSPI GUI Software Files

3   Hardware Description

The AS726x-iSPI design consists of AS726x device with associated flash memory, LED circuit, and jumper configuration for UART/I^{2}C interface.

3.1   Hardware Architecture
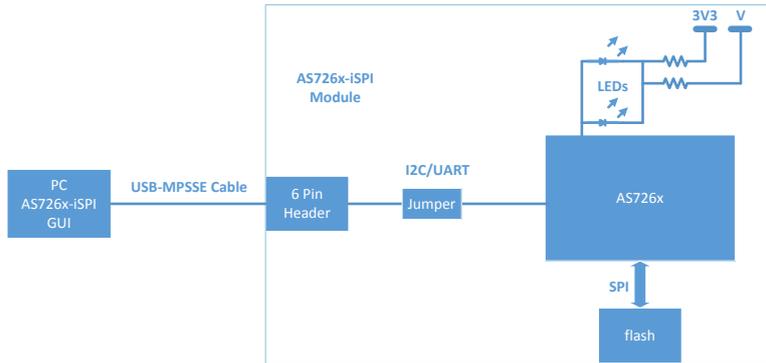
Figure 3. Board Block Diagram
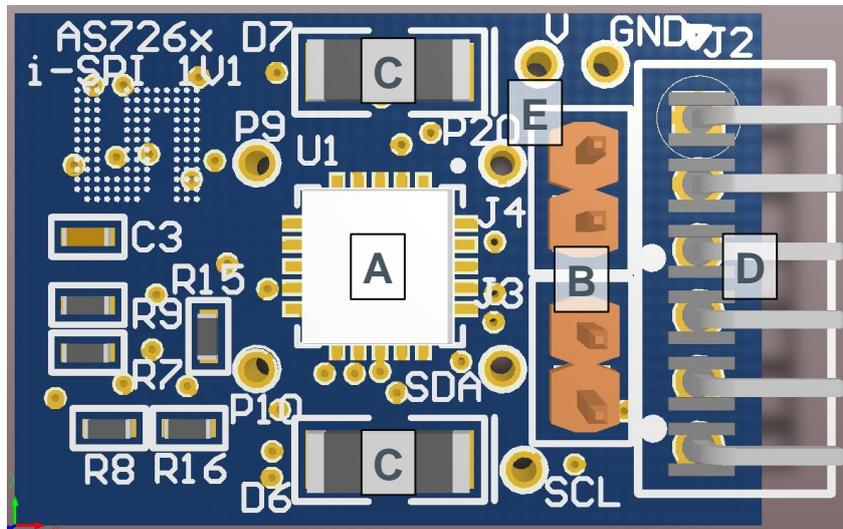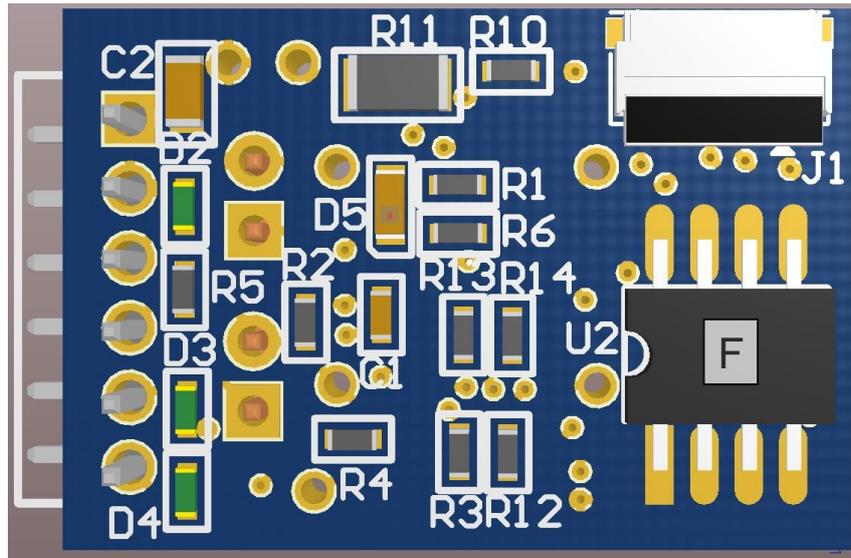
Pos.	Designator	Comment
A	U1	AS726x Device
B	J3, J4	Headers for UART or I²C interface Selection;
C	D6, D7	Place Holders for LEDs;
D	J2	Six Pins Header; Connect to PC with USB-MPSSE cable;
E	V	Test Point for External Supply for LEDs;
F	U2	Flash memory;

Figure 4. Devices, Connectors and LEDs

3.2 Power Supply

The AS726x-iSPI module is powered by FTDI C232HM-DDSHL-0 USB-MPSSE cable that connects to a personal computer. The voltage of the supply is 3.3V.

3.3 UART/ I²C Interface

AS726x device supports either UART or I²C interface as the communication path. By default, AS726x-iSPI demo kit is shipped as using I²C interface. AS726x Spectral Sensing iSPI GUI software can be used to evaluate AS726x features.

If the UART interface is desired, please adjust the jumper setting as below. Any terminal software configured as 115200 Baud Rate, 8-Bit Data, No Plarity, 1-Bit Stop would be fine.

	J3	J4
UART Interface	OFF	ON
I²C Interface	ON	OFF

Figure 5. Jumper Setting

Please note that you may need to reset the USB-MPSSE cable by plug-out/plug-in when you switch UART and I²C interface during your evaluation.

3.4   LEDs

AS726x-iSPI module has two place holders for LED light sources. By default there are no LEDs populated onboard.
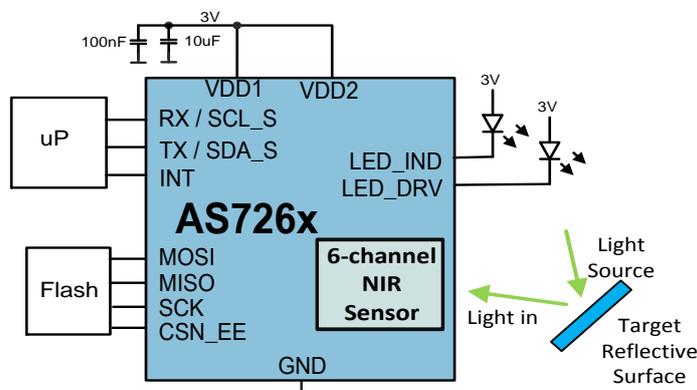
Figure 6. Generic Application

A generic application of AS726x is to shine light rays to a target and AS726x produces outputs based on the reflected light rays as Figure 6. So LED selection is determined by the spectral responsivity of reflected light and characteristics of the target. For example, if the target is expected to absorb 680nm light and the application needs to distinguish the target from others, a broadband white LED might be used as the light source with AS7263 and the 680nm channel should be checked. Various applications may require different light sources.

LEDs can be powered either by onboard 3.3V rail or by an external supply. If 3.3V rail is used, please populate LEDs on D6/D7 and install a zero ohms resistor on R5. If 3.3V supply is not high enough for some higher forward voltage LEDs, an external supply can be connected to the test point, V and the current limit resistor R11 should be installed. Please note that R5 has to be removed when connect external supply to the module.

The AS726x can drive LEDs with 12.5mA, 25mA, 50mA, or 100mA. There is also an indicator LED, D5, onboard. The LEDs can be controlled and configured with the vitual I^{2}C register, 0x07 (the register address 0x87 for write).

Addr: 0x07/0x87				LED Control
Bit	**Bit Name**	**Default**	**Access**	**Bit Description**
7:6	RSVD	0	R	Reserved
5:4	ICL_DRV	00	R/W	LED_DRV current limit 'b00=12.5mA; 'b01=25mA; 'b10=50mA; 'b11=100mA;
3	LED_DRV	0	R/W	Enable LED_DRV 1: Enabled; 0: Disabled
2:1	ICL_IND	00	R/W	LED_IND current limit 'b00=1mA; 'b01=2mA; 'b10=4mA; 'b11=8mA;
0	LED_IND	0	R/W	Enable LED_IND

Addr: 0x07/0x87				LED Control
				1: Enabled; 0: Disabled

Figure 7. Register for LED Configuration

For UART interface, AT command ATLED1 = 100/0 to turn the LEDs D6/D7 ON/OFF and ATLEDC = 0xXY (one byte) configures the LED current. X sets the LED current and Y configures the indicator LED current. ATLED0 and ATLEDC controls/configures the indicator LED, D5.

AT Commands	LED (D6/D7)	LED (D5)
ATLED0 = 100/0	-	ON/OFF
ATLED1 = 100/0	ON/OFF	-
ATLEDC = 0xXY	Set LED Current	Set LED Current
X = 0000b, Y = 0000b	12.5mA	1mA
X = 0001b, Y = 0001b	25mA	2mA
X = 0010b, Y = 0010b	50mA	4mA
X = 0011b, Y = 0011b	100mA	8mA

Figure 8. AT Commands for LED Control

When ever the board is powered, the LED should be on for a short time and off. If the LED keeps flashing, it implys something wrong in the communication between AS726x device and the flash memory.

3.5   Others

AS726x-iSPI module can be wired to customer controller for development/evaluation. The test points, SDA/SCL, can be used for monitoring UART/I^{2}C bus transaction. Also pin 6 of J2 provides the connection to INT. If interrupt is required to get the sensor data, this pin will be convienient for watching interrupt signal.

4   Software Description

This evaluation kit comes with the Spectral Sensor dashboard software running on a Windows computer for evaluating AS726x features. The USB Data Stick has the application notes for the Spectral Sensor software. Please refer to the document for more information to use the software.

5   AS726x-iSPI Schematics
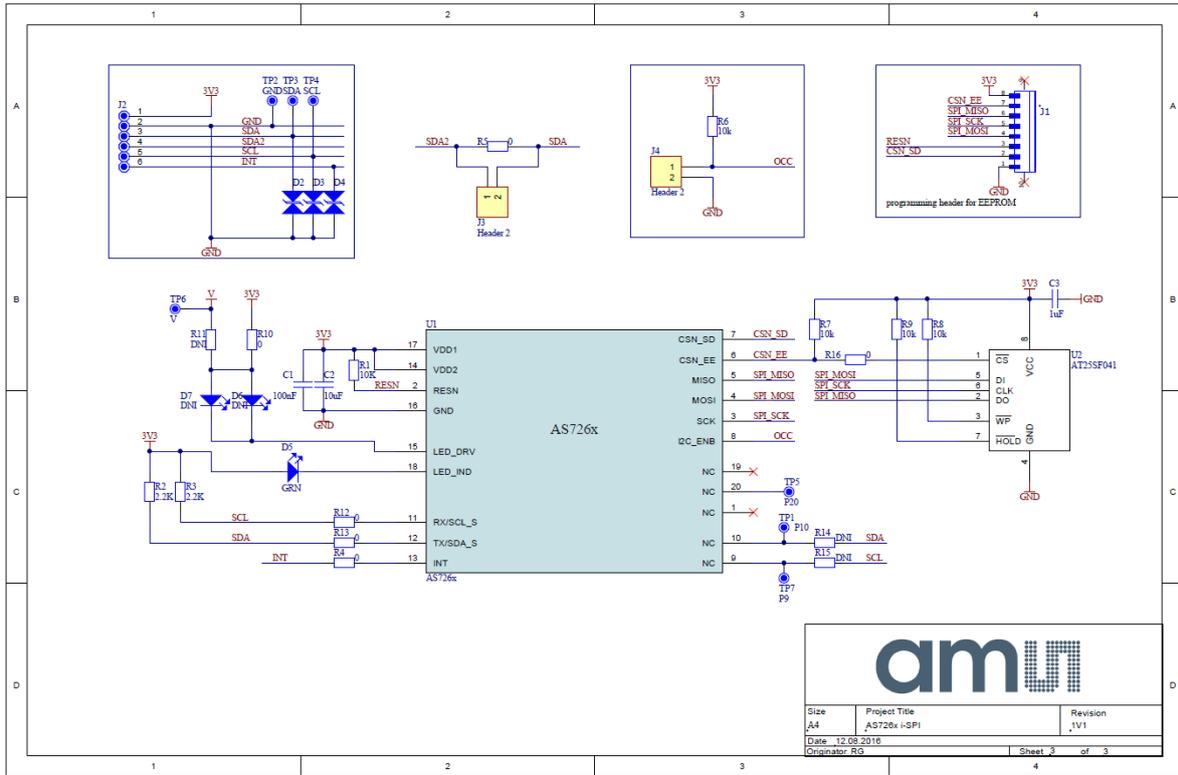
6 Ordering & Contact Information

Ordering Code	Description
Demo/Eval Kit AS726x-iSPI	AS726x-iSPI Evaluation Kit

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8 Revision Information

Changes from previous version to current revision 2-00 (2017-Feb-23)	Page
Updated with AS726x-iSPI Board Version 2.0	
Updated LED Section	

Note: Page numbers for the previous version may differ from page numbers in the current revision.

Correction of typographical errors is not explicitly mentioned.