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## Eval Kit Manual

# AS5247

## Adapter Board

AS5247-MF\_EK\_AB

## Content Guide

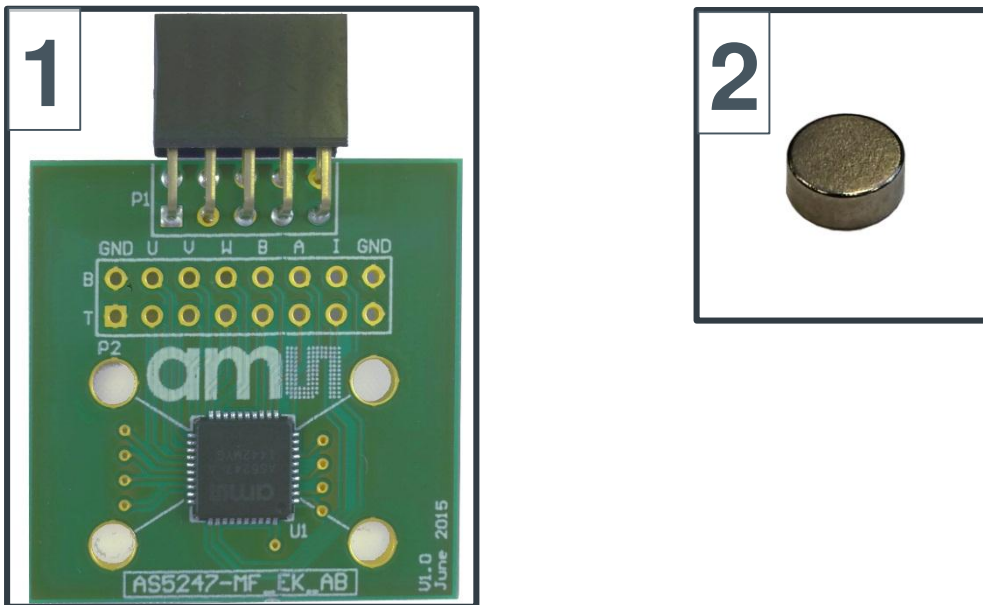
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## 1 Introduction

The AS5247 adapter board is a small PCB allowing simple and quick testing or evaluation of the AS5247 magnetic position sensor without the need to build a test fixture or design an own PCB.

### 1.1 Kit Content

Figure 1: Kit content



Pos.	Item	Comment
1	AS5247-MF_EK_AB	Adapter board
2	AS5000-MD8H-1	Diametric Magnet, D8x2.5mm, NdFeB, Bomatec AG

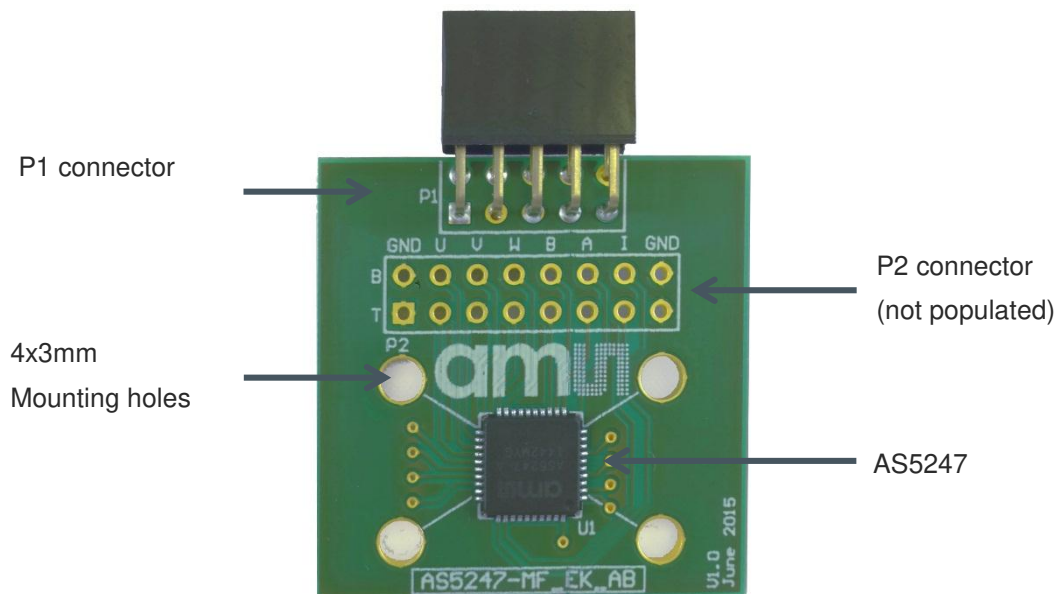
## 2 Board description

The PCB can either be connected to an external microcontroller, or to the I&P USB Box using the 5-pin dual row connector P1.

P1 is already populated and gives access for power supply as well as SPI interface.

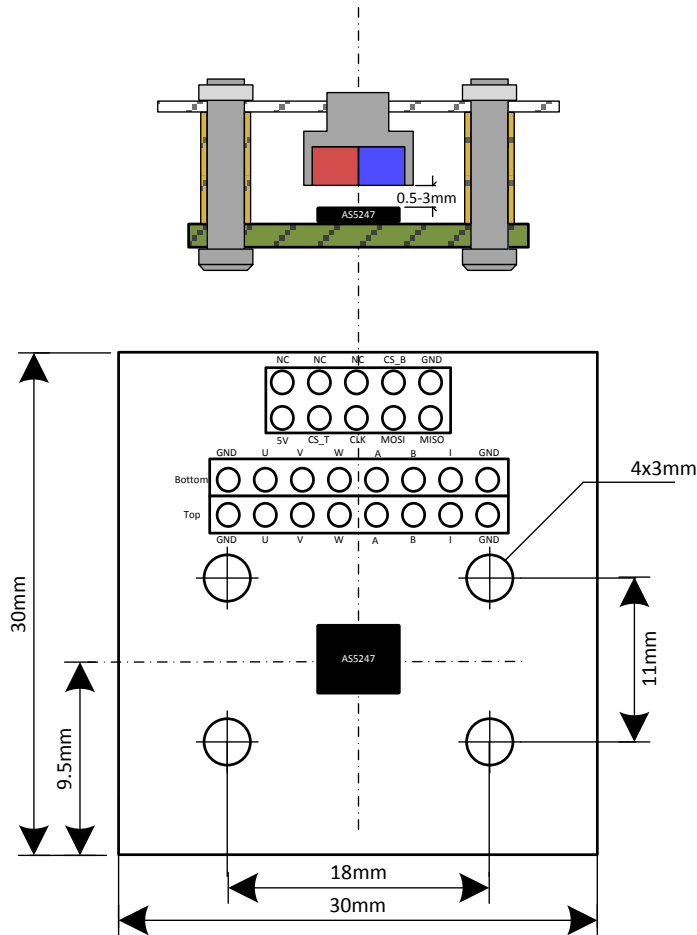
P2 has to be populated with a 2x8 pin header and can be used for ABI and UVW interfaces.

**Figure 2: AS5247 adapter board**



## 2.1 Mounting the AS5247 adapter board

Figure 3: Mounting and dimensions



A 8 x 2.5 mm diametric magnetized magnet must be placed over or under the AS5247 sensor, and should be centered on the middle of the package with a tolerance of 0.5 mm. The airgap between the magnet surface and the package should be maintained in the range 0.5 mm to 3 mm.

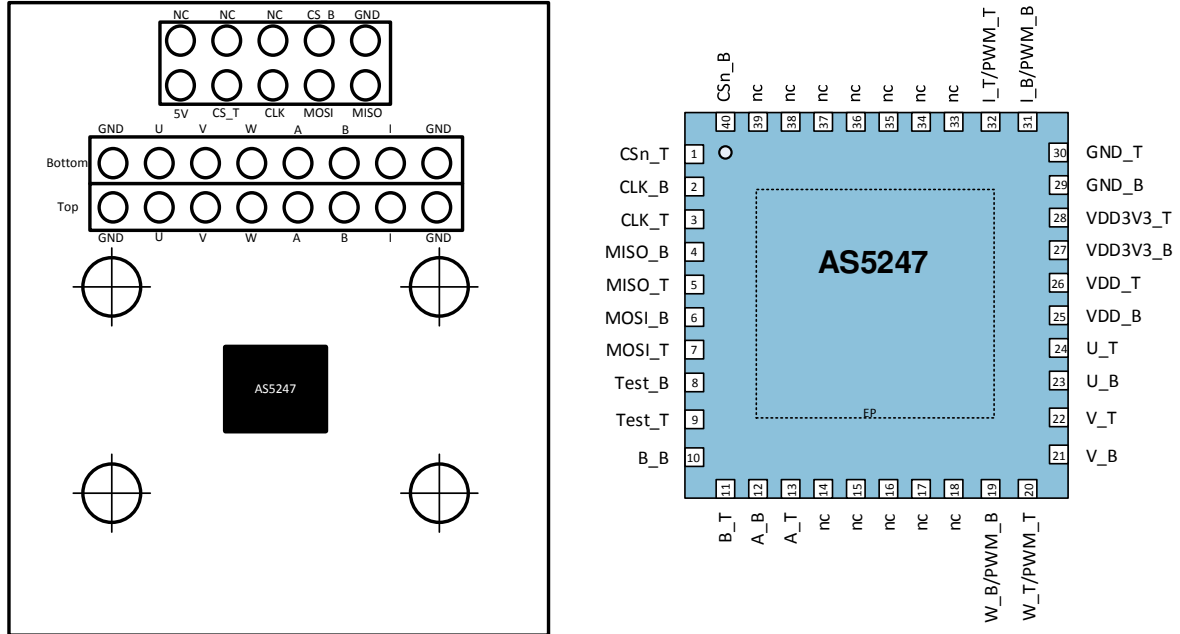
Recommended nominal airgap for the 8 mm magnet = 2 mm.

Recommended nominal airgap for the 6 mm magnet = 1.5 mm.

The magnet holder must not be ferromagnetic. Materials as brass, copper, aluminum, stainless steel are the best choices to make this part.

### 3 AS5247 adapter board and pinout

Figure 4: AS5247 adapter board and sensor pinout



Pin# Board	Pin# AS5247	Symbol board	Type	Description
P1 - 1	25, 26	5V	Power supply	Positive supply voltage
P1 - 2		NC		Not connected
P1 - 3	1	CS_T	Digital input	SPI chip select (active low) top die
P1 - 4		NC		Not connected
P1 - 5	2, 3	CLK	Digital input	SPI Clock
P1 - 6		NC		Not connected
P1 - 7	6, 7	MOSI	Digital input	SPI MOSI
P1 - 8	40	CS_B	Digital input	SPI chip select (active low) bottom die
P1 - 9	4, 5	MISO	Digital output	SPI MISO
P1 - 10	29, 30	GND	Power supply	Ground
P2 - 1	29, 30	GND	Power supply	Ground
P2 - 2	29, 30	GND	Power supply	Ground
P2 - 3	24	U_T	Digital output	Commutation signal U of top die

Pin# Board	Pin# AS5247	Symbol board	Type	Description
P2 - 4	23	U_B	Digital output	Commutation signal U of bottom die
P2 - 5	22	V_T	Digital output	Commutation signal V of top die
P2 - 6	21	V_B	Digital output	Commutation signal V of bottom die
P2 - 7	20	W_T	Digital output	Commutation signal W or PWM of top die
P2 - 8	19	W_B	Digital output	Commutation signal W or PWM of bottom die
P2 - 9	13	A_T	Digital output	Incremental signal A (quadrature) of top die
P2 - 10	12	A_B	Digital output	Incremental signal A (quadrature) of bottom die
P2 - 11	11	B_T	Digital output	Incremental signal B (quadrature) of top die
P2 - 12	10	B_B	Digital output	Incremental signal B (quadrature) of bottom die
P2 - 13	32	I_T	Digital output	Incremental signal I (index) or PWM of top die
P2 - 14	31	I_B	Digital output	Incremental signal I (index) or PWM of bottom die
P2 - 15	29, 30	GND	Power supply	Ground
P2 - 16	29, 30	GND	Power supply	Ground

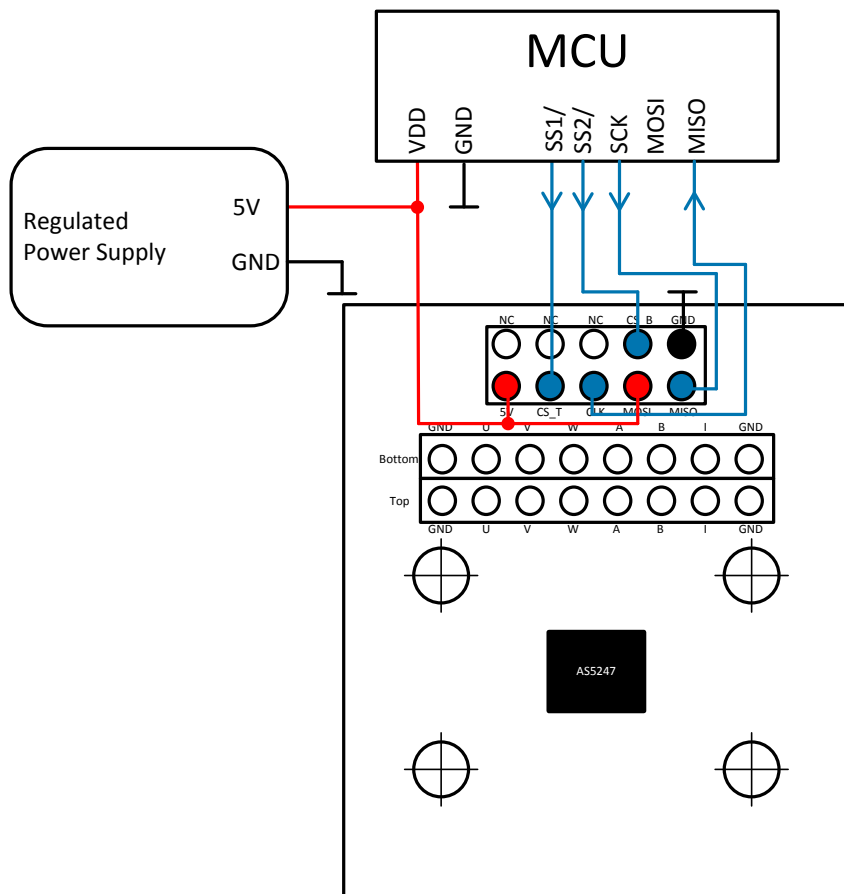


## 4 Operation case

### 4.1 One device SPI mode, unidirectional – 3 wire

The AS5247 adapter board can be directly connected to an industry standard SPI port of a microcontroller. The minimum connection requirements for unidirectional communication between the microcontroller and the AS5247 are MISO, CLK, CSn. In this case the MOSI pin is tied to VDD which will result in reading only the 14-bit Angle Register (0x3FFF). See AS5247 datasheet register table, register 0x3FFF.

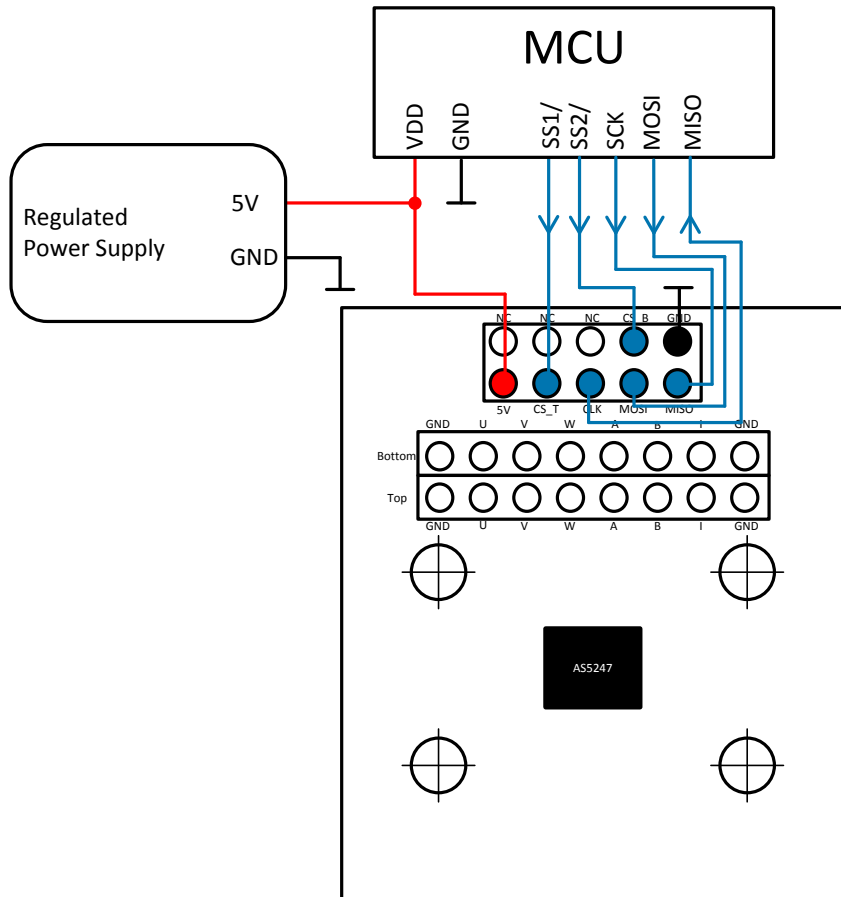
**Figure 5: One device SPI mode, unidirectional – 3 wire**



## 4.2 One device SPI mode, bidirectional – 4 wire

If it's needed to read other registers than the Angle Register (0x3FFF) or to write to registers of the AS5247 the MOSI connection is required.

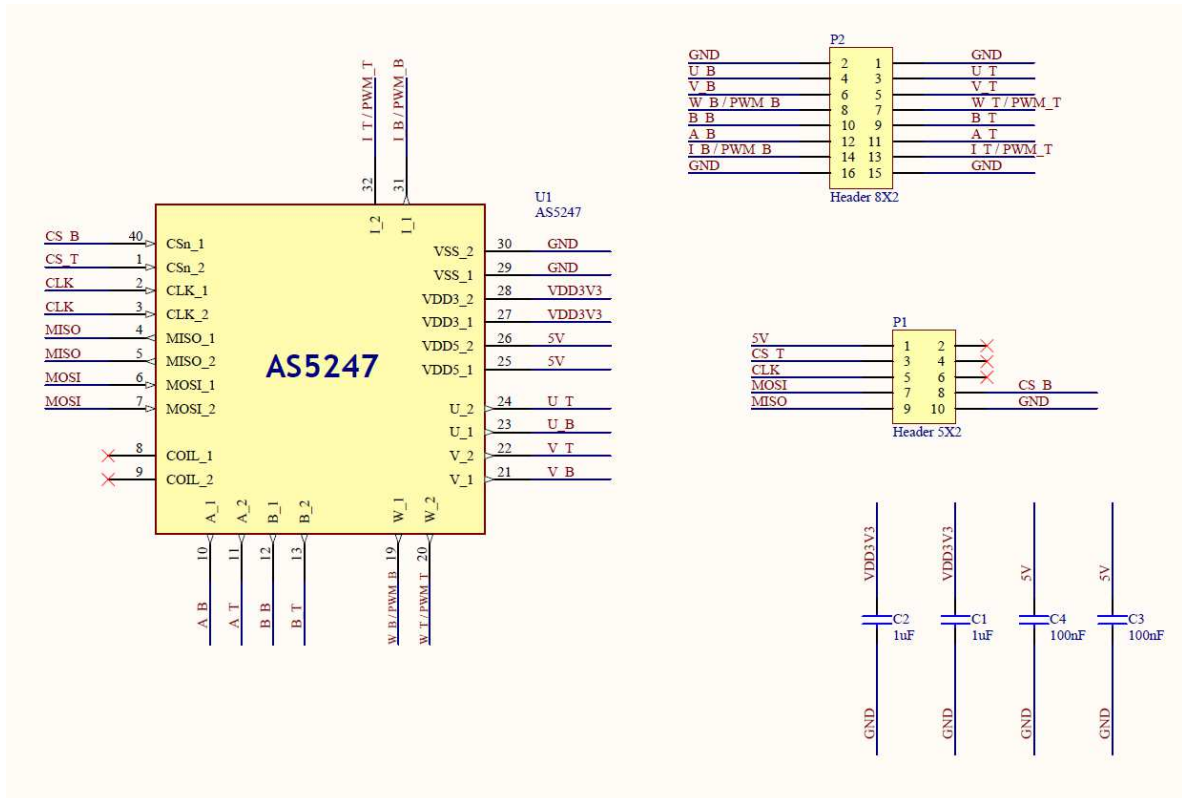
Figure 6: One device SPI mode, bidirectional – 4 wire



## 5 AS5247-MF\_EK\_AB Hardware

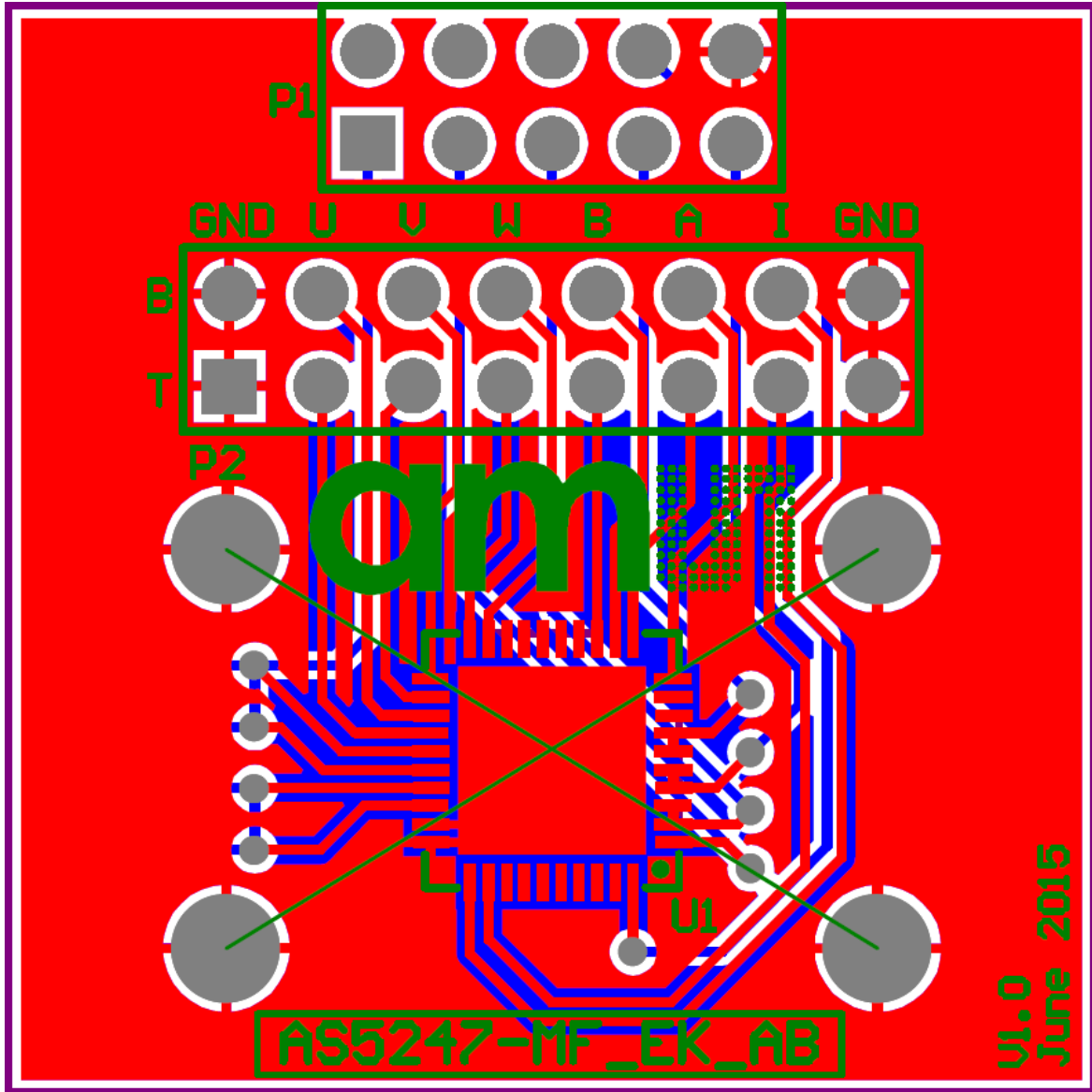
### 5.1 AS5247-MF\_EK\_AB schematics

Figure 7: AS5247-MF\_EK\_AB schematics



## 5.2 AS5247-MF\_EK\_AB PCB layout

Figure 8: AS5247-MF\_EK\_AB PCB layout



## 6 Ordering & Contact Information

Ordering Code	Description
AS5247-MF_EK_AB	AS5247 Eval Kit Adapter Board

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## 8 Revision Information

Changes from previous version to current revision 1-10 (2015-Sep-16)	Page
Initial version 1-00	
V 1-10, Mechanical dimension changed	5
V 1-10, AS5247 Pinout changed	6

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