



24-Bit ADC Module

BMH23M001 User Guide

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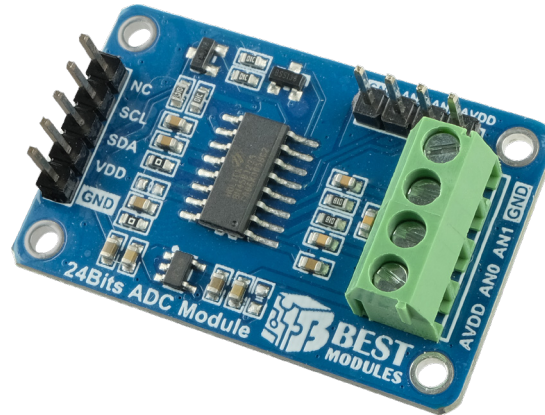
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Introduction

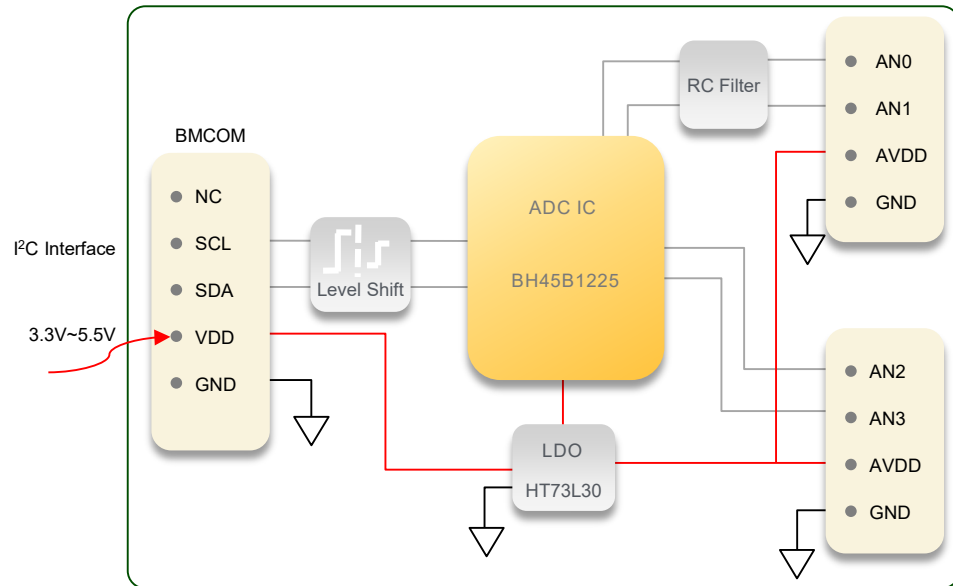
The Best Modules BMH23M001 is a 24-bit ADC module, which is developed by using 24-bit ADC IC, the BH45B1225. The module principle is based on ADC analog-to-digital conversion. The module has two ADC input interfaces, which can be used with sensors based on Wheatstone bridge principle. The on-board LDO has the characteristics of low output noise, which makes the ADC measurement accuracy more accurate and stable. The module can be used together with a Level Shift circuit, the module supports wide voltage of 3.3V~5.5V. The module can use I²C communication mode through BMCOM interface to read AD value and other functions. The module is suitable for use in smart products such as smart cups and coffee machines.



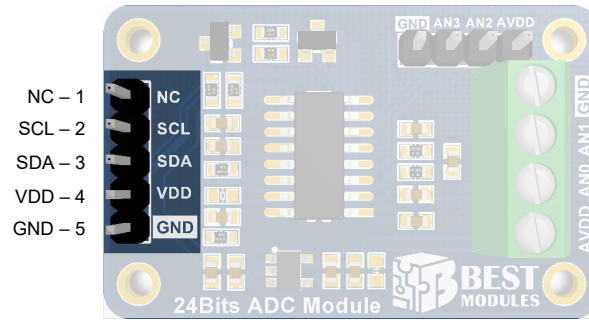
Features

- Operating voltage: 3.3~5.5V
- Operating current: 1mA @ 5V
- Standby current: <1.5 μ A @ 5V (No load)
- 24-bit ADC IC: BH45B1225
- 24-bit resolution A/D converter, the average Effective Number of Bits (ENOB) is up to 21.9 bits
- Analog signal input interfaces:
 - ◆ Wheatstone bridge sensor interface \times 1 – AVDD, AN0, AN1, GND
 - ◆ Analog signal input interface \times 1 – AVDD, AN2, AN3, GND
- Communication interface:
 - ◆ BMCOM \times 1 – NC, SCL, SDA, VDD, GND
 - ◆ Communication mode: I²C (address: default 0x68)
- Provides Arduino Library support
- Module size: 39.0mm \times 24.6mm \times 12.2mm

Block Diagram

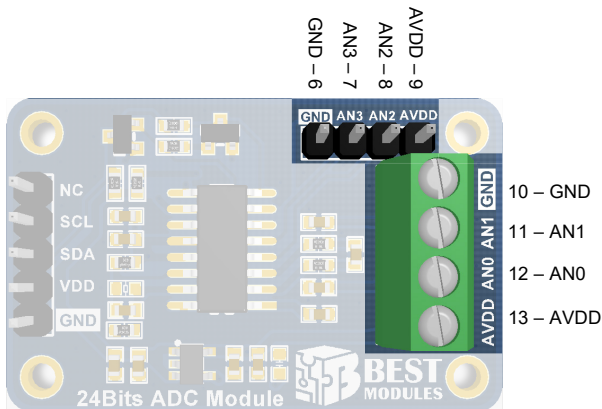


Pin Description



BMCOM Pin:

Pin	Function	Description
1	NC	Not connection
2	SCL	I ² C clock line
3	SDA	I ² C data line
4	VDD	Positive power supply
5	GND	Negative power supply, ground



Analog Signal Input Interfaces:

Pin	Function	Operating Mode	Description
6	GND	Common signal input	Analog negative power supply, ground
7	AN3		A/D converter input channel 3
8	AN2		A/D converter input channel 2
9	AVDD		Analog positive power supply
10	GND	Wheatstone bridge input	Analog negative power supply, ground
11	AN1		A/D converter input channel 1
12	AN0		A/D converter input channel 0
13	AVDD		Analog positive power supply

Technical Specification

Recommended Operating Conditions

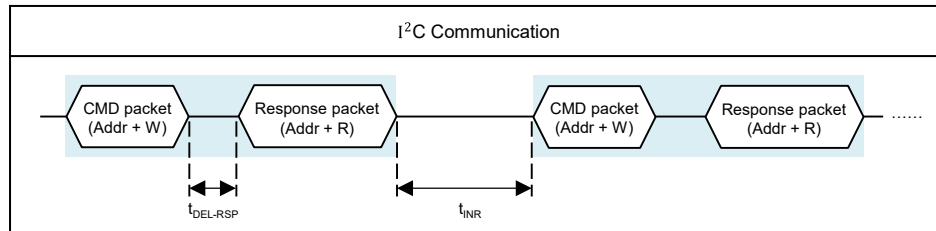
Ta=25°C

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V _{DD}	Module Operating Voltage	—	3.3	—	5.5	V
I _{DD}	Module Operating Current	V _{DD} =5.0V	—	1	—	mA
I _{STB}	Standby Current	V _{DD} =5.0V	—	—	1.5	µA
ENOB	Effective Number of Bits	V _{REF} =2.5V, Gain=32, Data rate=10Hz	—	20.7	—	Bit
		V _{REF} =2.5V, Gain=64, Data rate=10Hz	—	20.1	—	
		V _{REF} =2.5V, Gain=128, Data rate=10Hz	—	19.4	—	

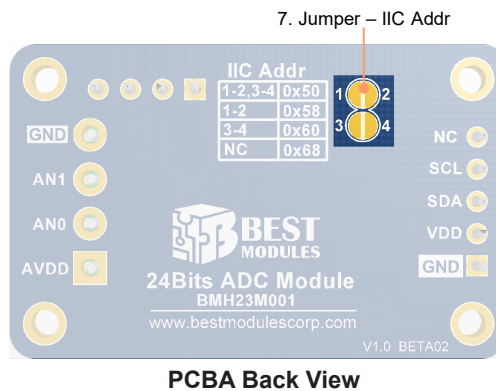
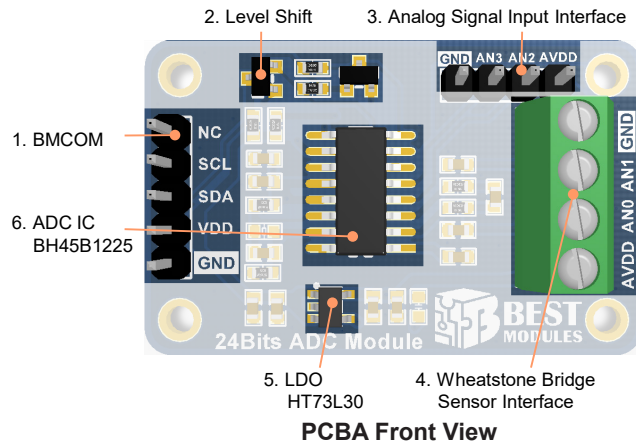
Timing Specification

Ta=25°C

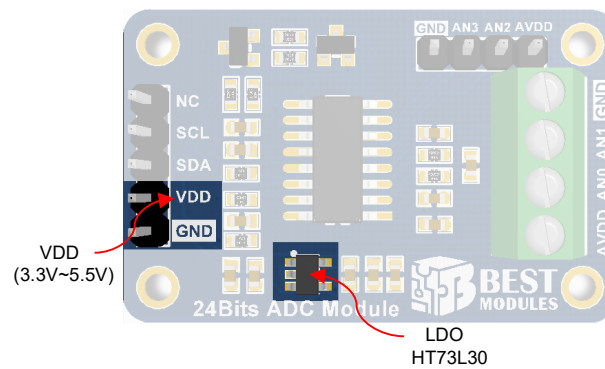
Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
t _{DEL-RSP}	Response Delay Time	V _{DD} =5.0V	1	—	—	ms
t _{INR}	Interval Time	V _{DD} =5.0V	1	—	—	ms



Hardware Overview

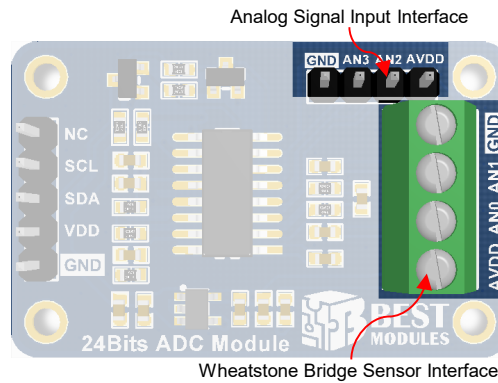


Power Supply



- BCOM Pin: Enter 3.3V~5.5V through VDD
- The module on-board LDO, the HT73L30, has the characteristics of low output noise, which makes the ADC measurement accuracy more accurate and stable.

Analog Signal Input Interface Selection



- Wheatstone bridge sensor interface: The corresponding channels are AN0 and AN1. Together with the load RC filter circuit, it has strong anti-interference ability and good low-frequency performance. The port is connected with a terminal connector. It is suitable for sensors based on Wheatstone bridge principle.
- Analog signal input interface: The corresponding channels are AN2 and AN3. The port is connected with a pin connector.

Communication Interface

- Communication mode: I²C
- I²C address selection: Default 0x68

I²C address format:

MSB							LSB
A6	A5	A4	A3	A2	A1	A0	R/W
1	1	0	1	0	0	0	

Slave address (0x68)

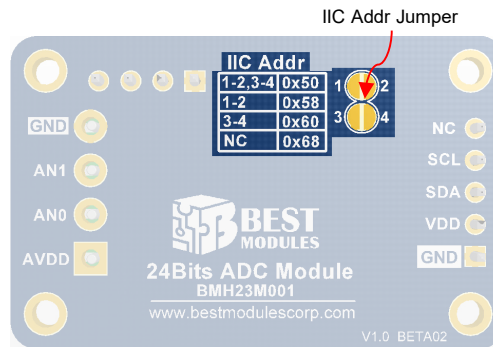
Note: R/W=1: Read
=0: Write

- I²C communication rate: ≤400kHz
- Communication logic reference voltage: 3.3V~5.5V
- The SCL/SDA pin of Module with 2.2kΩ pull-up resistor
- Communication protocol:
 - ◆ Refer to the BH45B1225 datasheet

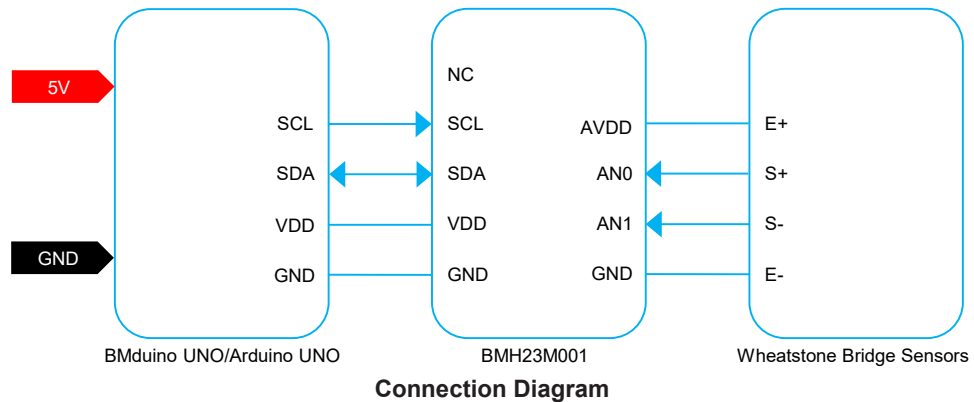
Jumper

- I²C address selection:

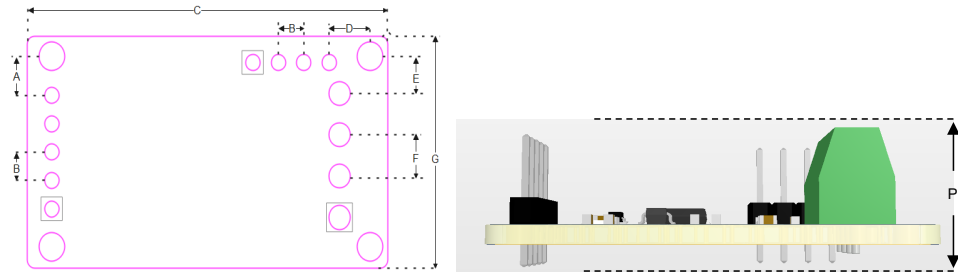
I ² C Addr Jumper		I ² C Address
1-2	3-4	
Short circuit	Short circuit	0x50
Short circuit	Open circuit	0x58
Open circuit	Short circuit	0x60
Open circuit	Open circuit	0x68 (Factory default)



Application Circuits



Dimensions



Dimension Information

Symbol \ Unit	mm	inch
A	4.57	0.18
B	2.54	0.1
C	39.0	1.54
D	4.22	0.17
E	4.40	0.17
F	3.50	0.14
G	24.6	0.97
P	12.2	0.48

Dimension List

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