Alcohol Detector Module

BMA34M421
User Guide

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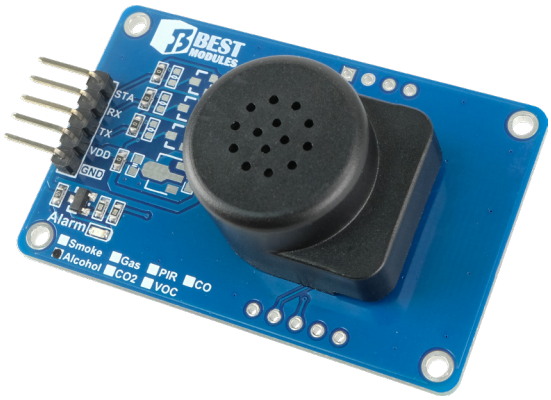
www.bestmodulescorp.com

Contents

Introduction

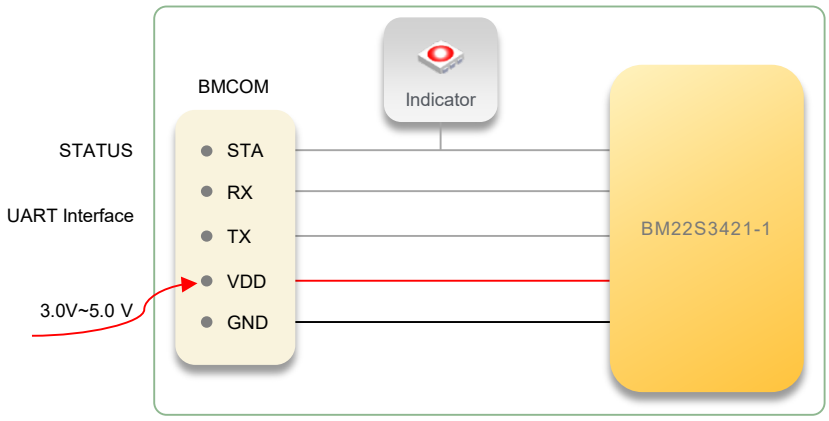
The BMA34M421 is an alcohol detector module from Best Modules. It includes an integrated MEMS alcohol digital sensor, the BM22S3421-1. The module has been factory-calibrated, which can output the real-time alcohol gas A/D value and alcohol concentration level. The module uses the BMCOM interface and UART communication method to achieve functions such as reading alcohol gas concentration data. The module is suitable for use in air quality monitors, loT devices, chemical plant monitors, etc.



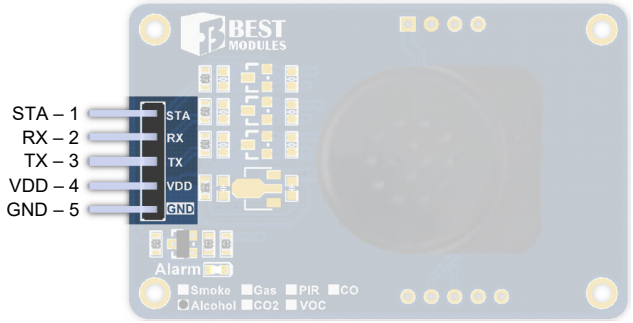
Features

- Operating voltage: 3.0V~5.0V
- Operating current: 17mA @ 3.3V
- Integrated MEMS alcohol digital sensor: BM22S3421-1
- Detection range: 0~400ppm
- Output the alcohol gas A/D value
- Output the alcohol gas concentration level: Level 1 (low concentration) ~ Level 4 (high concentration)
- Alcohol concentration alarm function
- Fault detection function
- Default warm-up time: About 180s
- Communication interface:
  - ♦ BMCOM×1 (STA, RX, TX, VDD, GND)
  - ♦ Communication mode: UART (baud rate: 9600bps)
- Provides Arduino Library support
- Module size: 59.3mm×33.88mm×20.0mm

Block Diagram



Pin Description



BMCOM pins:

Pin	Function	Description
1	STA	Status pin, used to indicate alarm status
2	RX	UART receiving data line
3	TX	UART transmitting data line
4	VDD	Positive power supply
5	GND	Negative power supply, ground

Technical Specifications

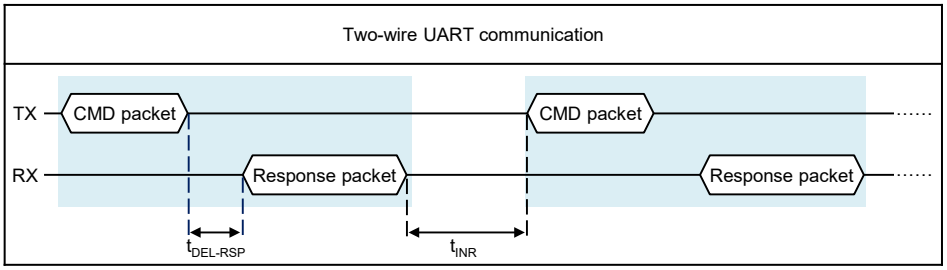
Recommended Operation Conditions

Ta=25°C

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{DD}	Operating Voltage	—	3.0	3.3	5.0	V
I_{DD}	Operating Current	V_{DD}=3.3V	—	17	—	mA

Timing Specifications

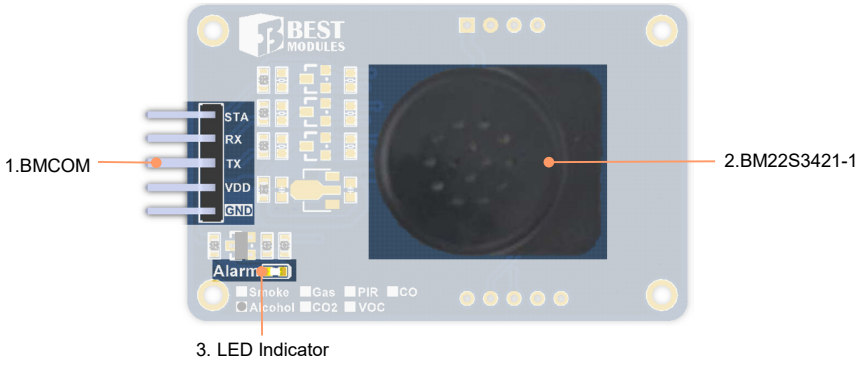
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
	Warm-up Time	V_{DD}=3.3V	—	180	—	s
$t_{DEL-RSP}$	Response Delay Time	V_{DD}=3.3V	—	—	1	ms
t_{INR}	Interval Time	V_{DD}=3.3V	—	—	2	ms



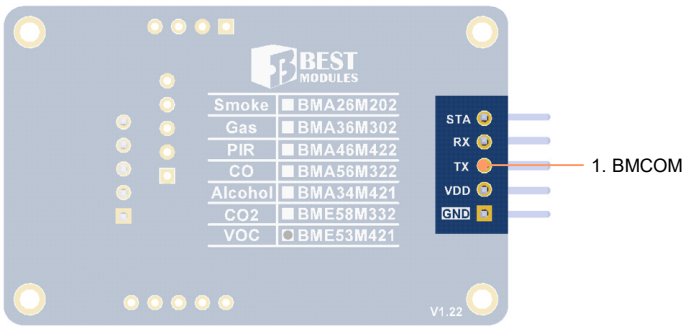
Note: 1. The module needs to be warmed up after the software was reset or restored factory setting.

2. When the module is in the warm-up or calibration status, do not execute other instructions, otherwise the module will be abnormal and a power-on reset needs to be executed.

Hardware Overview

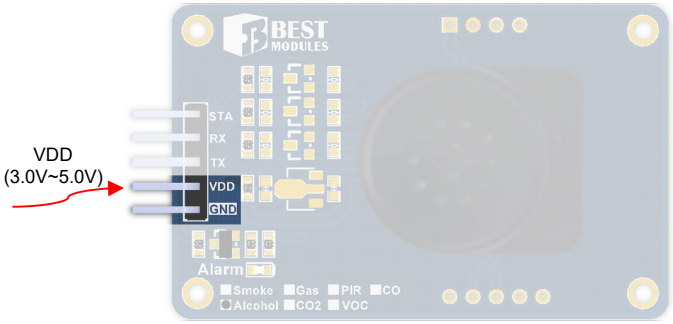


PCBA Front View



PCBA Back View

Power Supply



- BMCOM pin: 3.0V~5.5V input from VDD.

STA Pin

- The output level of this pin can be used to indicate whether the module alarms.
- When the alcohol gas concentration has achieved the alarm concentration level (default to level 3) and remains there for at least 3s, the module will enter the alarm status.
- When the alcohol gas concentration drops to the exit alarm concentration level (default to level 1) and remains there for 3s, the module will cancel alarm.
- The alarm level can be set as high (default) or low level.

  Taking the high alarm level as an example:

Alarm Status	STA Level
Enter alarm	High level
Cancel alarm	Low level

LED Indicator

- Alarm LED: LED on when alarming (when the alarm level is set high).

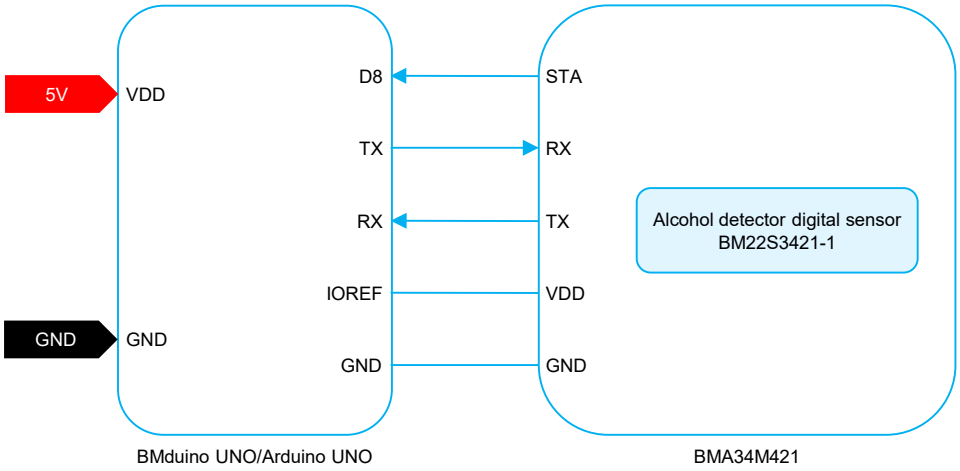
Communication Interface

- Communication mode: UART
- Baud rate: 9600bps
- Communication logic reference voltage: 3.0V~5.5V
- Communication protocol:
  - ♦ Refer to the BM22S3421-1 datasheet

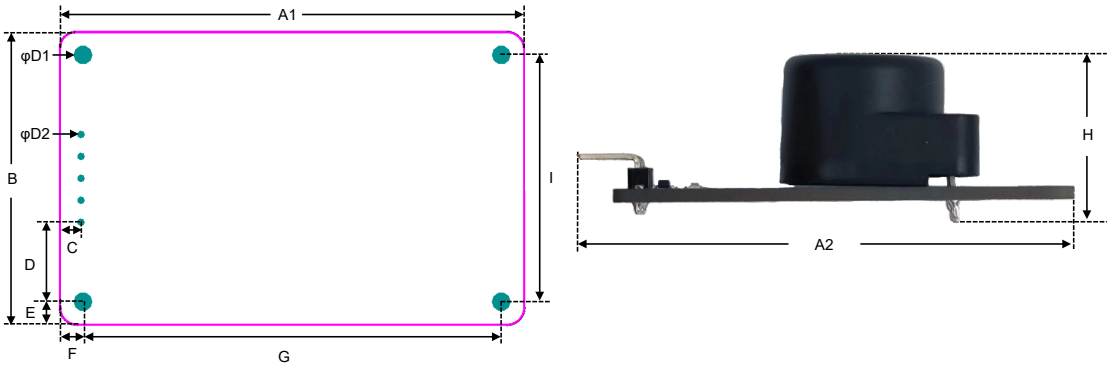
MEMS Alcohol Digital Sensor: BM22S3421-1

The BM22S3421-1 is an MEMS alcohol digital sensor, which includes an integrated MCU as the master device with a UART communication interface, which can offer a wide applications. The module has advantages of small size, long service life, low cost and no external drive circuit requirement, etc.

Application Circuit



Dimensions



Dimension Information

No. \ Unit	mm	inch
A1	53.83	2.119
A2	59.30	2.335
B	33.88	1.334
H	20.00	0.787
C	2.42	0.095
D	9.21	0.363
E	2.65	0.104
F	2.65	0.104
G	48.53	1.911
I	28.58	1.125
D1	0.9	0.035
D2	2.2	0.086

Dimension List