



Infrared CO2 Sensor Module (Model: MH-Z19B)

User's Manual

(Version: 1.7)

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Zhengzhou Winsen Electronics Technology Co., Ltd

ISO9001 certificated company

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Please keep the manual properly, in order to get help if you have questions during the usage in the future.

Zhengzhou Winsen Electronics Technology CO., LTD.

MH-Z19B NDIR CO2 Module

1. Profile

MH-Z19B NDIR infrared gas module is a common type, small size sensor, using non-dispersive infrared (NDIR) principle to detect the existence of CO₂ in the air, with good selectivity, non-oxygen dependent and long life. Built-in temperature compensation; and it has UART output and PWM output. It is developed by the tight integration of mature infrared absorbing gas detection technology, precision optical circuit design and superior circuit design.

2. Applications

*HVAC refrigeration

*Air cleaner device

*Indoor air quality monitoring

*Smart home

*Ventilation system

*School

3. Main Features

Chamber is gold plated, water-proof and anti-corrosion

High sensitivity, low power consumption

Good stability

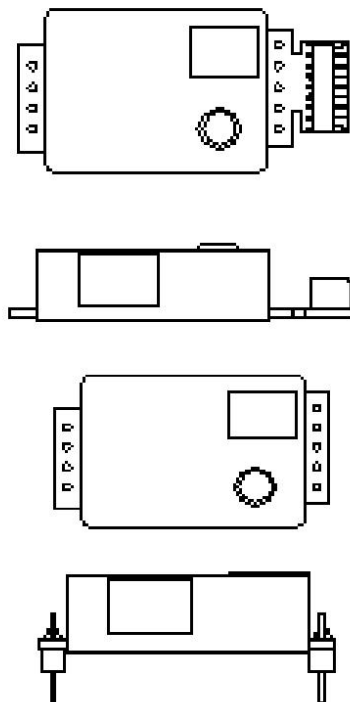
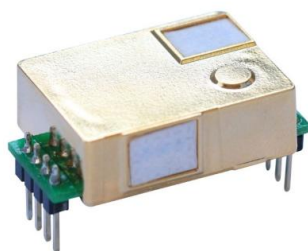
Temperature compensation, excellent linear output

Multiple output modes: UART, PWM

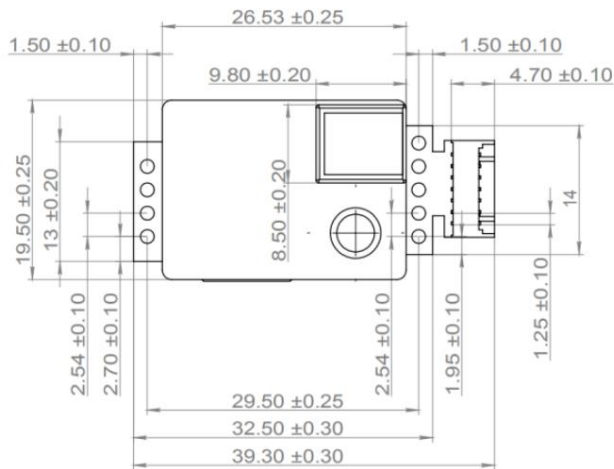
Long lifespan

Anti-water vapor interference, anti-poisoning

4. Structure

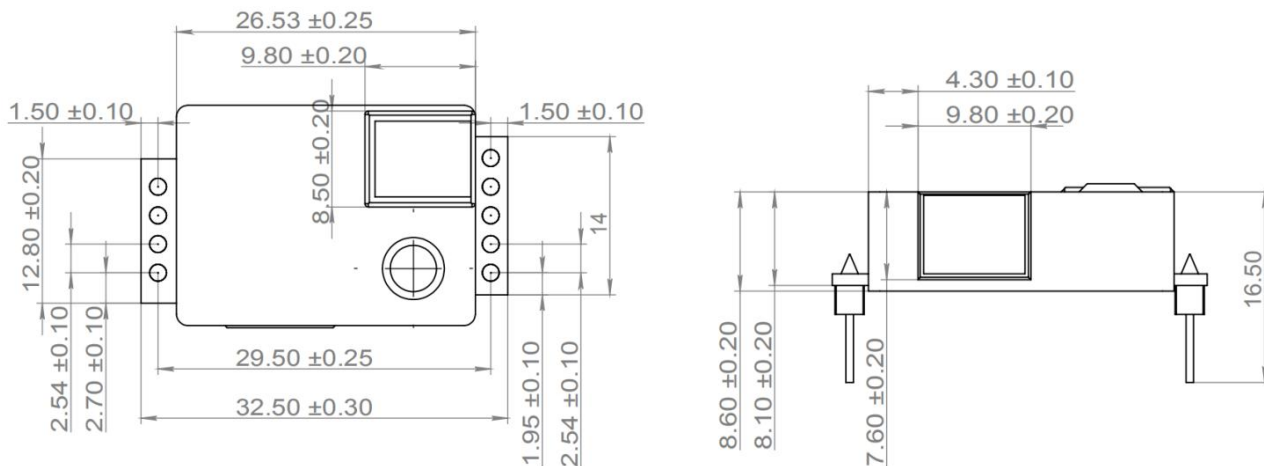


Terminal connection type:



Unit: mm

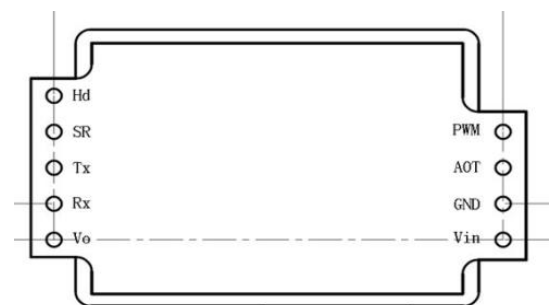
Pins connection type:



Pin is the common standard type with square cross section.

Pins connection type:

Pin	Pin Definition
Vin	Positive pole of power (Vin)
GND	Negative pole of power (GND)
PWM	PWM
Hd	HD(zero point calibration, low level lasting for over 7s is effective)
Rx	UART(RXD)TTL Level data input
Tx	UART(TXD)TTL Level data output
Vo	reserved
SR	reserved
AOT	reserved



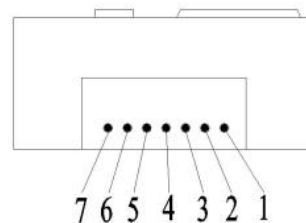
Terminal connection type:

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Pin	Terminal pin Definition
Pin 1	reserved
Pin 2	reserved
Pin 3	Negative Pole of power (GND)
Pin 4	Positive Pole of power (Vin)
Pin 5	UART(RXD)TTL Level data input
Pin 6	UART(TXD)TTL Level data output
Pin 7	reserved



Note: All the pins for reserved must be vacant while the sensor is working.

5. Detection range and accuracy

Detection Gas	Formula	Detection Range	Accuracy
Carbon Dioxide	CO ₂	400~2000ppm	± (50ppm+5% reading value)
		400~5000ppm	
		400~10000ppm	

6. Main parameters

Model No.	MH-Z19B
Detection Gas	CO ₂
Working voltage	4.5 ~ 5.5 V DC
Average current	< 20mA (@5V power supply)
Peak current	150mA (@5V power supply)
Interface level	3.3 V (Compatible with 5V)
Detection Range	400~2000/5000/10000ppm(optional)
Output signal	Serial Port (UART) (TTL level 3.3V)
	PWM
Preheat time	3 min
Response Time	T ₉₀ < 120 s
Working temperature	-10 ~ 50 °C
Working humidity	0 ~ 95% RH (No condensation)
Weight	5 g
Lifespan	> 5 years

7. Output

PWM output	
Take 400~2000ppm for example	
CO2 output range	400~2000ppm
Cycle	1004ms±5%
Cycle start high level output	2ms(theoretical value)
The middle cycle	1000ms±5%
cycle end low level output	2ms(theoretical value)
CO2 concentration: $C_{ppm} = 2000 \times (TH - 2ms) / (TH + TL - 4ms)$	
C _{ppm} : CO2 concentration could be calculated by PWM output	
TH high level output time during cycle	
TL low level output time during cycle	

9. Notes

- 9.1 Please avoid the pressure of its gilded plastic chamber from any direction, during welding, installation, and use.
- 9.2 When placed in small space, the space should be well ventilated, especially for diffusion window.
- 9.3 The module should be away from heat, and avoid direct sunlight or other heat radiation.
- 9.4 The module should be calibrated termly, the suggested period is not longer than 6 months.
- 9.5 Do not use the sensor in the high dusty environment for long time.
- 9.6 To ensure the normal work, the power supply must be among 4.5V~5.5V DC rang, the power current must be not less than 150mA. Out of this range, it will result in the failure of the sensor. (The concentration output is low, or the sensor can not work normally.)
- 9.7 During the zero point calibration procedure by manual, the sensor must work in stable gas environment (400ppm) for over 20 minutes. Connect the HD pin to low level (0V) for over 7 seconds.
- 9.8 Forbid using wave soldering for the sensor.
- 9.9 When soldering with soldering iron, set the temperature to be $(350 \pm 5) ^\circ C$, and soldering time must be within 3 seconds.

9.0 As for pin version sensor, it is recommended to use soldering socket to directly insert or remove sensors for convenient maintenance.