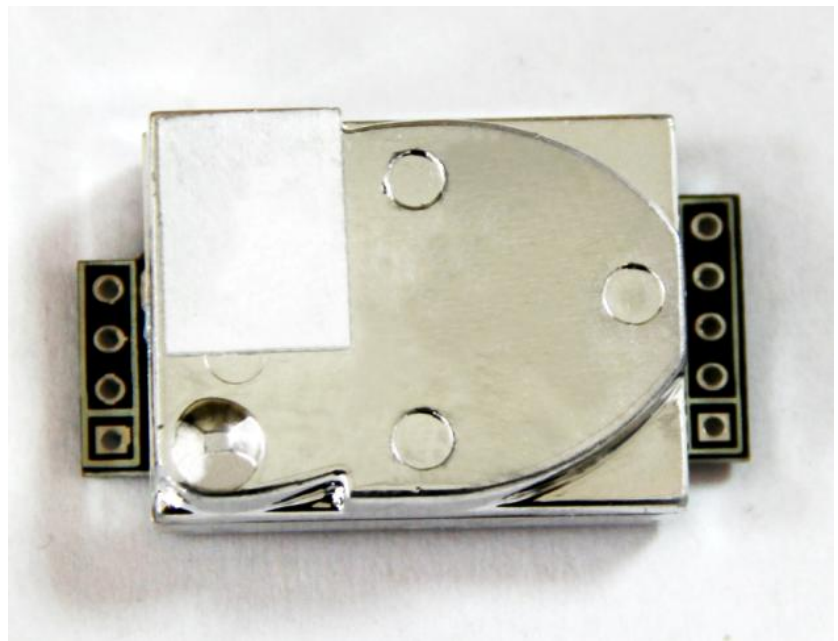




# USER MANUAL

## MINI INFRARED CO2 MODULE CM1106 SERIES SINGLE BEAM



*ADD : Fenghuang No. 3  
Road, Fenghuang Industrial  
Park, Eastlake Hi-tech  
Development Zone, Wuhan  
430205, China*

*TEL: +86-27-81628831*

*FAX: +86-27-87405251*

*info@gassensor.com.cn*

Ver.2014.12

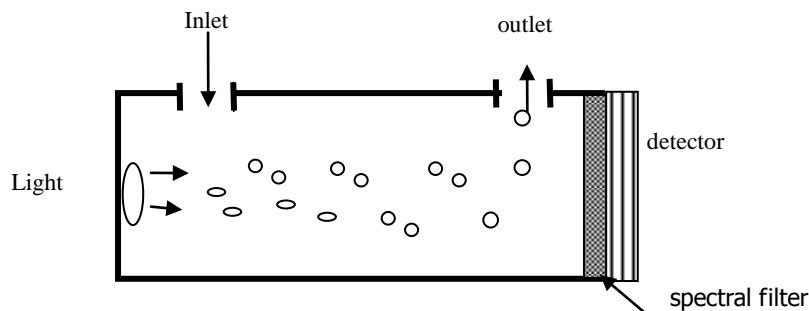
**Wuhan Cubic Optoelectronics Co., Ltd**

## 1. Function

CM1106 CO<sub>2</sub> gas sensor module is mainly used to test CO<sub>2</sub> concentration, indoor air quality measurement, such as CO<sub>2</sub> measurement in ventilation control system, building, school, hospital and CO<sub>2</sub> control in air-conditioner, mushroom, fireplace.

## 2. Working principle

CO<sub>2</sub> gas is composed of different types of atoms have absorption spectrum in infrared range. Absorption intensity abides by Lambert-Beer's Law. Basic working principle of NDIR sensor is as below,



Basic mathematical model: A majority of both organic and inorganic polyatomic gas have specific absorptive wavelength in infrared region. It observes Lambert-Beer Law formula  $I = I_0 e^{-kpl}$  when infrared light is coming through. Light absorption intensity "i" can be described as  $i = I_0 - I = I_0 (1 - e^{-kpl})$ .  $I_0$ : intensity of incoming ray.  $I$ : transmitting beams.  $l$ : thickness of gaseous medium.  $p$ : gas concentration.  $k$ : absorption coefficient.

## 3 Specification

Technology: NDIR

Measurement range: 0-2000ppm

Max Drift:  $\pm 3\%$ FS

Resolution: 10ppm

Response Time (T<sub>90</sub>) : < 120S

Accuracy:  $\pm (50\text{ppm} + 5\% \text{ reading})$

Size: 33\*19.7\*8.9mm

Repeatability: <3%

Sampling method: diffusion

Working voltage: DC5V $\pm 5\%$

Working current: average --70mA, peak---120mA

PWM: linear output

UART: Data bit: 8; Stop bit: 1; Check bit: null

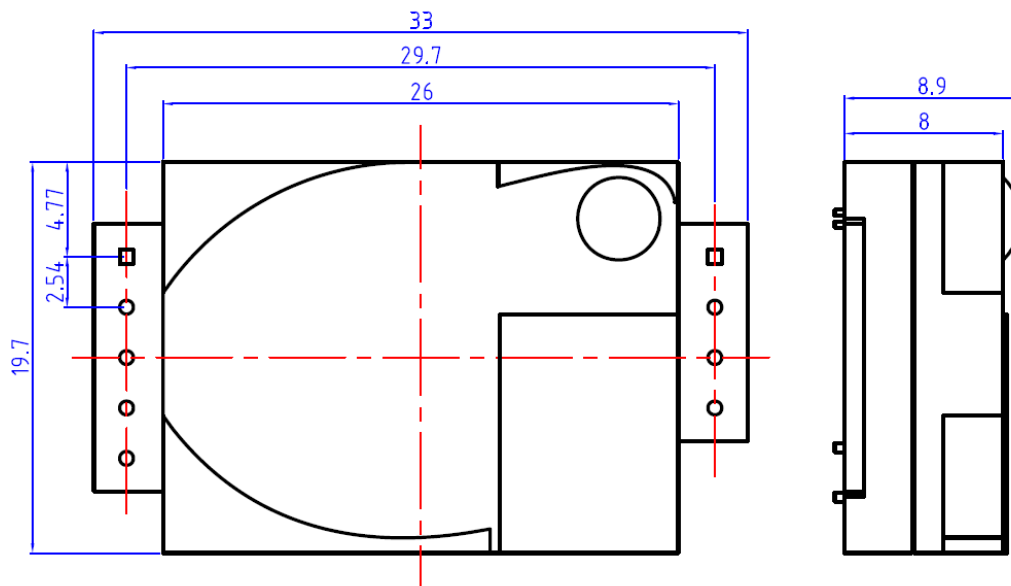
Standard baud rate: 9600bps

Working voltage: -10°C ~ 50°C

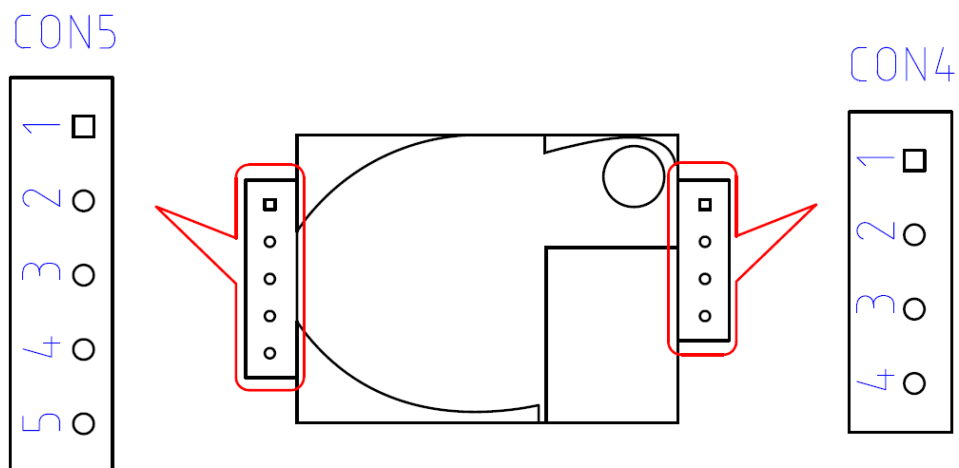
Humidity : 0~95%RH non-condensing

## 4 Dimensions

### 4.1 schematic diagram



### 4.2 I/O definitions



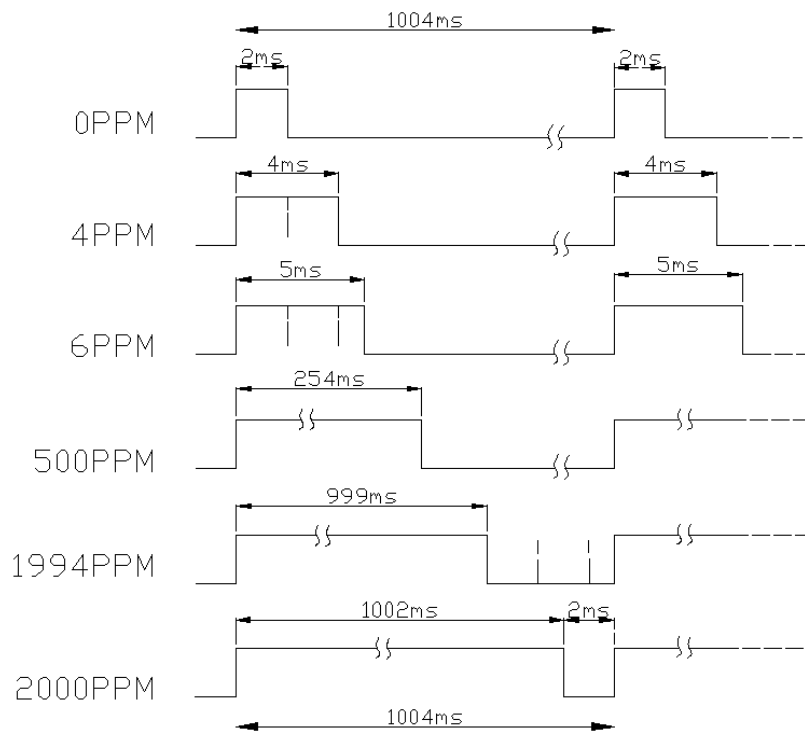
CON 5			CON 4		
NO.	NAME	DESCRIPTION	NO.	NAME	DESCRIPTION
1	+3.3V	POWER SUPPLY OUTPUT (+3.3V/100mA)	1	+5V	POWER SUPPLY INPUT (+5V)
2	RX	UART-RX (RECEIVING)	2	GND	POWER SUPPLY INPUT (GND)
3	TX	UART-TX (SENDING)	3	A	ALARMING (RESERVED)
4	R/T	RS485 (RESERVED)	4	PWM	PWM OUTPUT
5	CA	MANUAL CALIBRATION (RESERVED)			

## 5 PWM output

PWM cycle: 1004ms

Positive pulse width:  $(PPM/2) + 2ms$

PWM output diagram



## **6. After-sales services and consultancy**

TEL: 86-27-87405251      86-18627938861

ADD: Fenghuang No.3 Road, Fenghuang Industrial Park, Eastlake Hi-tech Development  
Zone, Wuhan 430205, China

FAX: 86-27-87401159

[Http://www.gassensor.com.cn](http://www.gassensor.com.cn)

E-mail: [info@gassensor.com.cn](mailto:info@gassensor.com.cn)