

### • Description

The sensor is designed for the measurement of CO<sub>2</sub> concentration in gas phase. It has all the advantages from NDIR products, such as good selectivity, high sensitivity, long life and independence to O<sub>2</sub>.

### • Performance Characteristics

Output Mode: UART, PWM

High precision

Dual channel

Size: 64mm×20mm×13mm(L×W×H)

### • Environmental

Storage temperature: -40 °C ~ 70 °C

Working temperature : -20 °C ~ 70 °C

Working humidity: 0 % ~ 93%RH non-condensing

### • Main Application

Indoor air monitoring

Ventilating system

In cars

Smart house

Others

### • Interface

Pin Number	Function
1	TTL TXD
2	TTL RXD
3	PWM Output
4	GND
5	VCC

### • Installation Instructions

The Module has two connectors. The sensor module Connector1 model is PH-2A and the Connector2 model is EH-3AW. The connector type of the customer matching Connector1 is PH-2Y and the Connector2 is EH-3Y. (If necessary, a special connecting line can be provided for the customer, please note the line length and communication mode of the order.) The module cannot work in dusty environment for a long time. Supply power should be in its proper range.

### • How To Place Order

In order to get the product you want, please specify the following information when place your order:

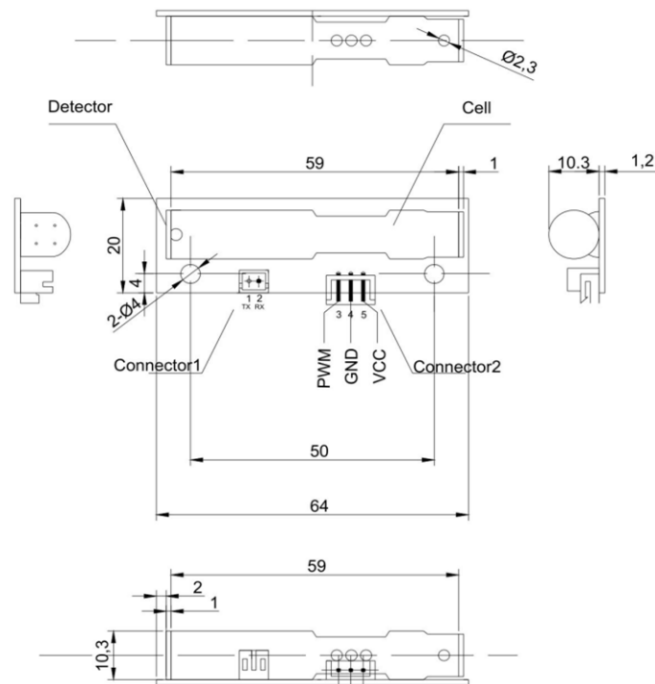
1. Model of the module.

2. Measuring Range and detection accuracy of the module.

For example:

IRM-Z01 400-4000ppm ±70ppm±5% reading

### Product Dimensions



All dimensions in mm

All tolerances ±0.2 mm unless otherwise stated

### Note

The performance data in this document was tested under standard conditions using the test circuit and test environment recommended by the NDIR CO<sub>2</sub> sensor.

Sensor performance varies under different environmental conditions, please contact us if you need more details.

### • Technical Data

Description	Parameter	Unit
Detection range	400-4000	ppm
Detection accuracy	±70ppm±5% of reading	/
Response time T <sub>90</sub>	< 3	minute
Warm-Up time	Set to work < 30	second
	Precision reached < 15	minute
Working voltage	5±0.5	V
Working current	I <sub>average</sub> : 80	mA
	I <sub>peak</sub> : 140	mA

### • PWM Output

PIN 3 is the PWM output, definition is: Concentration range : 400-4000ppm CO<sub>2</sub>

Cycle: 1004 ms ±5%

High level output of initial period:102ms (nominally)

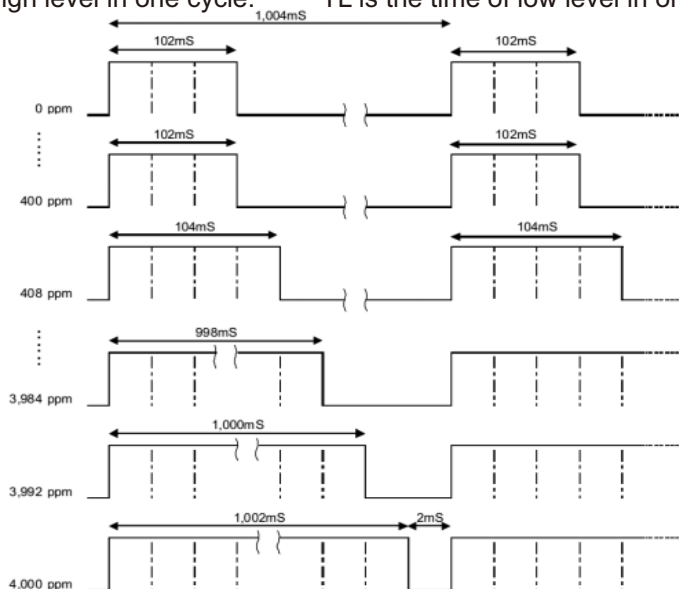
Central period:1002.0ms ±2%

Low level output of end period:2ms (nominally)

Formula to calculate the CO<sub>2</sub> concentration in PWM:

$C_{ppm} = 4000 \times (TH - 2ms) / (TH + TL - 4ms)$  where C<sub>ppm</sub> is the CO<sub>2</sub> concentration, unit in ppm ;

TH is the time of high level in one cycle. TL is the time of low level in one cycle.



### • UART Protocol

Baud rate : 19200bps, 8 bytes, first byte is stop, no check byte. The reading and return data is hexadecimal.

Concentration uploaded automatically in ASCII with the format :

32	32	x	x	x	x	x	32	p	p	m	\r	\n
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For example : output of 12345 ppm :

		1	2	3	4	5	p	p	m	
0x20,	0x20,	0x31,	0x32,	0x33,	0x34,	0x35,	0x20,	0x70,	0x70,	0x6d,