

• Description

The sensor is designed for the measurement of CO₂ concentration in gas phase. It has all the advantages from NDIR products, such as good selectivity, high sensitivity, long life and independence to O₂.

• Performance Characteristics

Output Mode: UART, PWM

High precision

Dual channel

Large range

• Environmental

Storage temperature: -20 °C ~ 80 °C

Working temperature : -10 °C ~ 50 °C

Working humidity: 0 % ~ 95%RH non-condensing

• Main Application

Indoor air monitoring

Ventilating system

In cars

Smart house

Others

• Interface

Pad1: VCC (5V)	Pad2: GND
Pad3: VCC (5V)	Pad4: GND
Pad5: RXD(UART) (0~5V NC)	Pad6: TXD(UART) (0~5V)
Pad7: SCL (0~5V)	Pad8: SDA (0~5V)
Pad9: GND	Pad10: DAC_OUT
Pad11: PSEN	Pad12: PWM
Pad13: ACCL	Pad14: MCDL

• Installation Instructions

The two parts of the sensor are connected by a wire, and the sensor and the client are connected by a double-row seat of 2.0 spacing. 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-203 5000ppm ±50ppm±5% reading

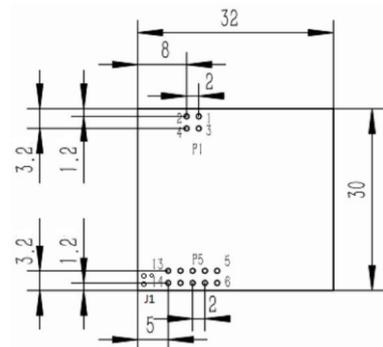
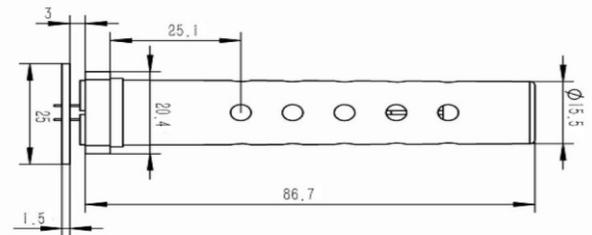
Website: www.semeatech.com

Address: 39, Valley View Irvine, CA 92612 Orange, USA

Tel: +1-949-683-2886 Email: info_us@semeatech.com

Product Dimensions

IRM203



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 CO₂ sensor.

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



• **Technical Data**

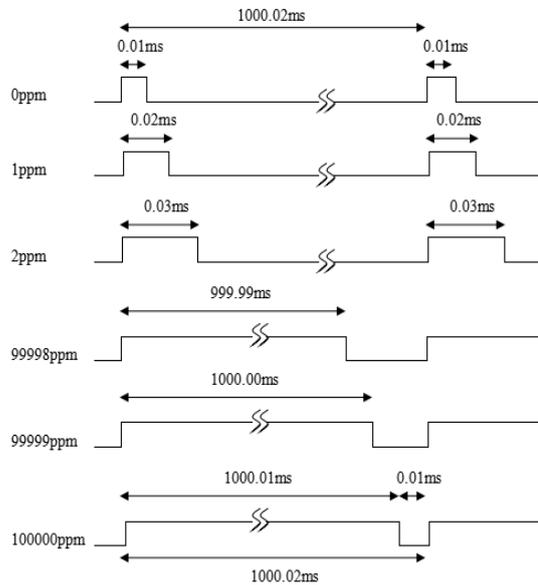
Description	Parameter	Unit
Detection range	5000(customizable)	ppm
Detection accuracy	±50ppm±5% of reading	/
Response time T ₉₀	< 90	second
Warm-Up time	Set to work < 90	second
	Precision reached < 120	second
Working voltage	5±0.5	V
Working current	I _{average} : 60	mA

• **PWM Output**

PIN 12 is the PWM output, definition is: Concentration range : 0ppm to 100000ppm CO₂
 Cycle: 1000.02 ms ±5% High level output of initial period:0.01ms (nominally)
 Central period:1000.00ms ±2% Low level output of end period:0.01ms (nominally)

Formula to calculate the CO₂ concentration in PWM:

$C_{ppm} = 100000 \times (TH - 0.01ms) / (TH + TL - 0.02ms)$ where C_{ppm} is the CO₂ 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,