



# **<sup>13</sup> Carbon Dioxide PbSe Sensor**

**(Model: REG-X2212-13CO2)**

# **User's Manual**

Version: 1.0

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Zhengzhou Winsen Electronics Technology Co., Ltd

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

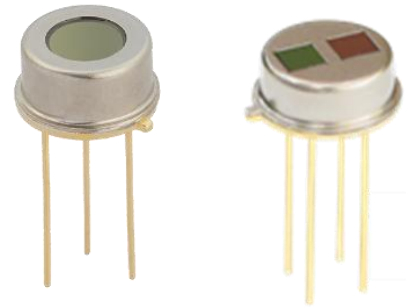
**Zhengzhou Winsen Electronics Technology CO., LTD.**

## 13 Carbon Dioxide PbSe Sensor

PbSe sensor is a lead-salt type infrared photoconductive sensor, and its working principle is based on the photoconductive effect of semiconductor materials, thereby converting infrared radiation energy into electrical signals. The PbSe sensor has strong absorption and response in the near and mid-infrared (1.0~5.0um) spectral bands. Using the principle of NDIR gas sensor, it can be applied to the detection of carbon 13 carbon dioxide of Helicobacter pylori breath detector.

### Features:

- \* TO-5 package, single channel/dual channel;
- \* Fast response;
- \* High detection rate;
- \* Window can be customized;



### Applications:

<sup>13</sup>CO<sub>2</sub> Helicobacter pylori breath detector;

### Parameters

Table 1

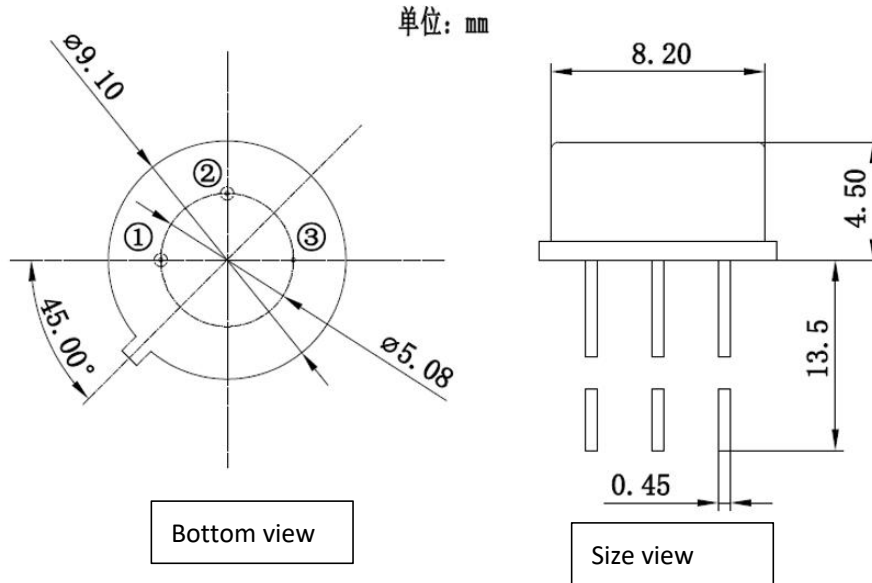
Item	Typical	Unit
Photosensitive area	2*2	mm
Response wavelength range	1~5	um
Response Time	20	us
Peak responsivity	4*10 <sup>4</sup>	V/W
Peak Normalized Detection Rate	1*10 <sup>10</sup>	cm·Hz <sup>1/2</sup> /W
dark resistance	1~10	MΩ
Operating temperature	-30~70	°C
Storage temperature	-55~70	°C

### Sensor Type

Sensor Part no.	Window type	Center wavelength (um)	Transmittance (%)	Channel	Note
REF-X2212H	Sapphire	1~5	>90%	Single	General type
REG-X2212-12CO2	Narrow Band Filters	4.26	>90%	Single	Carbon 12
REG-X2212-13CO2		4.40	>90%	Single	Carbon 13
REG-X2122-13CO2		4.26+4.40	>90%	Dual	C12+C13

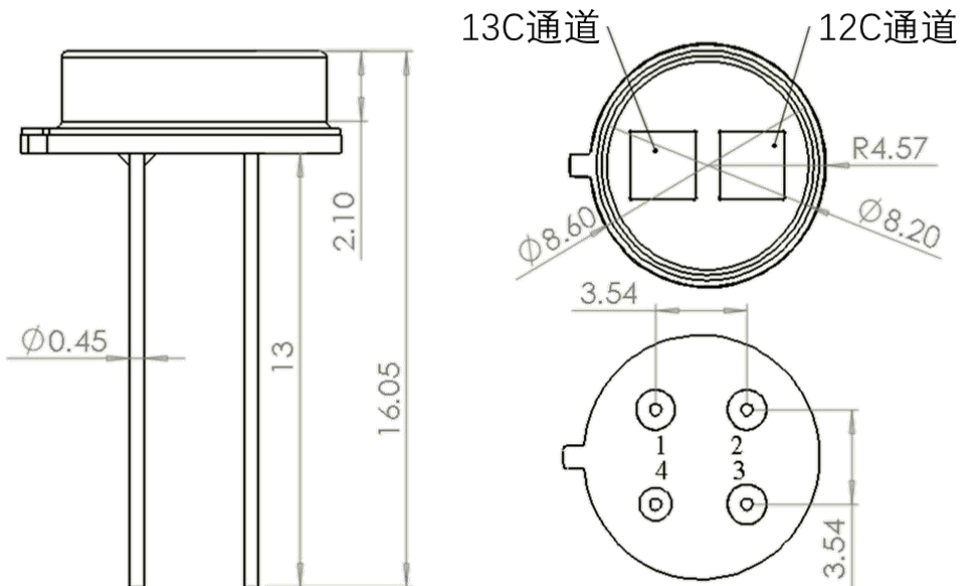
**Sensor Size and Pin definition: (unit:mm)**

Single channel:



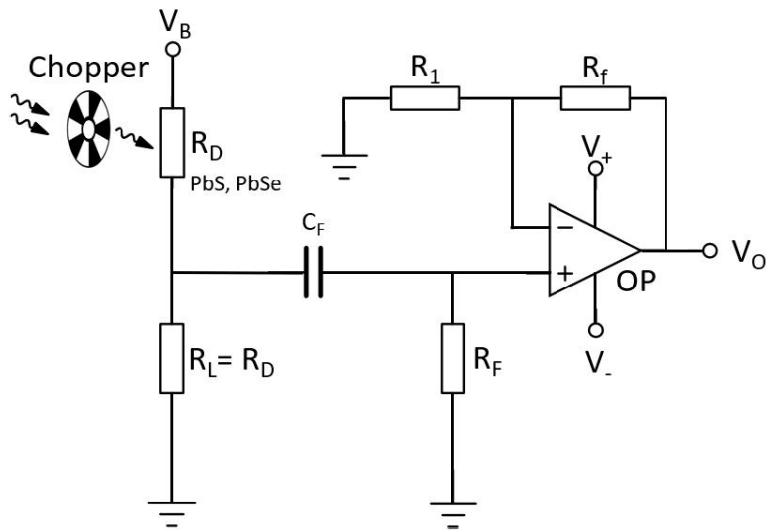
Pin	①	②	③
Definition	Detection	Detection	GND

Dual channel:

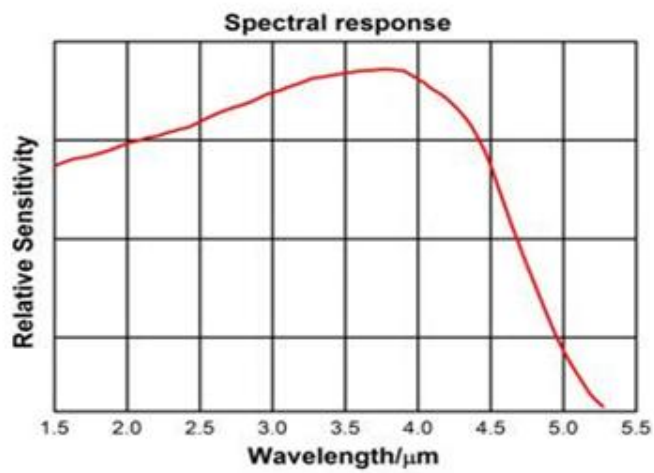


Pin	1	2	3	4
Definition	Detection 1 (13C)	Detection 2 (12C)	Detection (shared)	GND

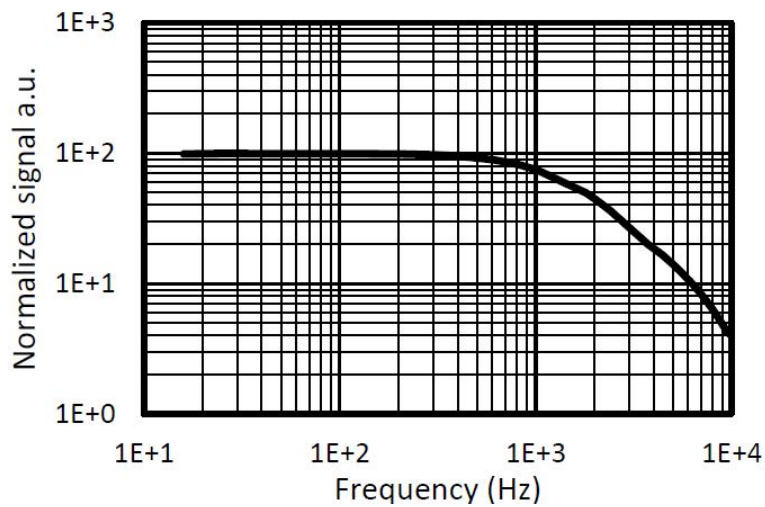
**Sensor typical amplifier circuit:**



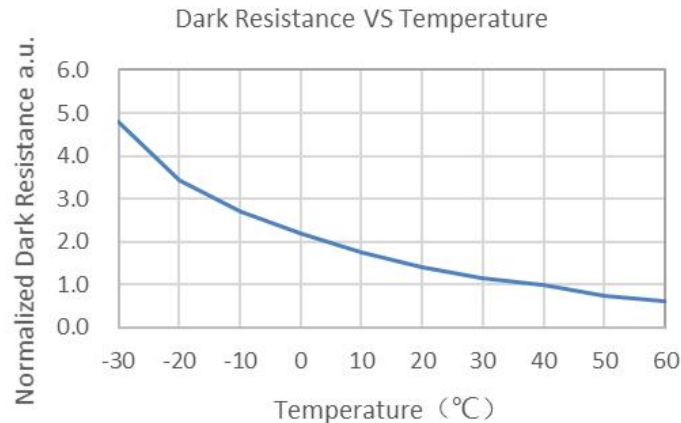
**Sensor Character:**



Sensor characteristic spectral response curve



The influence curve of different modulation frequencies on sensor performance



The influence curve of different temperatures on the dark resistance of the sensor

**Notes:**

- (1) A bias power supply is required to work during use. The sensor response signal increases linearly with the increase of the bias voltage, but the bias voltage should not be too high, generally 50V/mm;
- (2) The load resistance should match the sensor resistance to obtain the best output;
- (3) During use, the sensor should be prevented from frequent, excessive vibration, strong impact or collision, so as to prevent the sensor lead from falling off;
- (4) Avoid touching the sensor window with fingers during use, so as not to pollute the window and reduce the service life;
- (5) When the sensor is installed, the welding time should not exceed 5 seconds to prevent overheating from affecting the quality of the sensor.

**Note:** To keep continual product development, we reserve the right to change design features without prior notice.

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