Shenzhen Bofengsheng Electronics Co., Ltd. Product purchase link: https://shop63737513.taobao.com/?spm=2013.1.0.0.291c5ec9nTPwWx

MQ-2Combustible gas sensor

Product Description

The gas sensitive material used in MQ-2 gas sensor is

Tin dioxide (SnO) with low conductivity in the air$_2$). When the sensor is

When there is combustible gas in the environment, the conductivity of the sensor changes with the combustible gas in the air.

The voltage increases with the increase of the combustion gas concentration.

The change in conductivity is converted into an output signal corresponding to the gas concentration.

Number.

MQ-2 gas sensor has high sensitivity to propane and smoke.

It is also ideal for detecting natural gas and other flammable vapors.

It can detect a variety of combustible gases and is suitable for a variety of applications.

Low-cost sensor.

Sensor Features

This product has good sensitivity to propane, smoke, etc. in a wide concentration range, and has long life, low cost, and simple driving circuit.

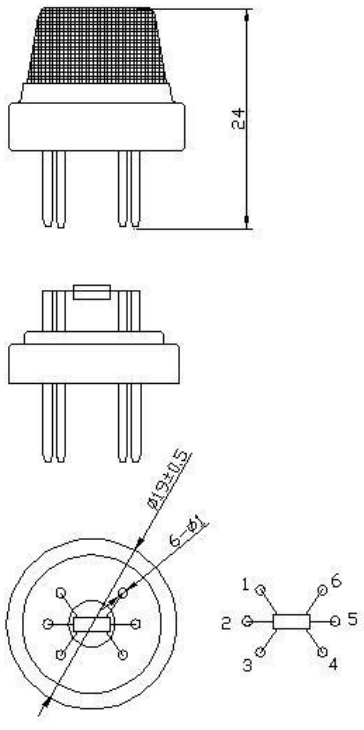
And other advantages.

Main Applications

It is widely used in household gas leak alarms, industrial combustible gas alarms and portable gas detection instruments.**Technical indicators**

surface1

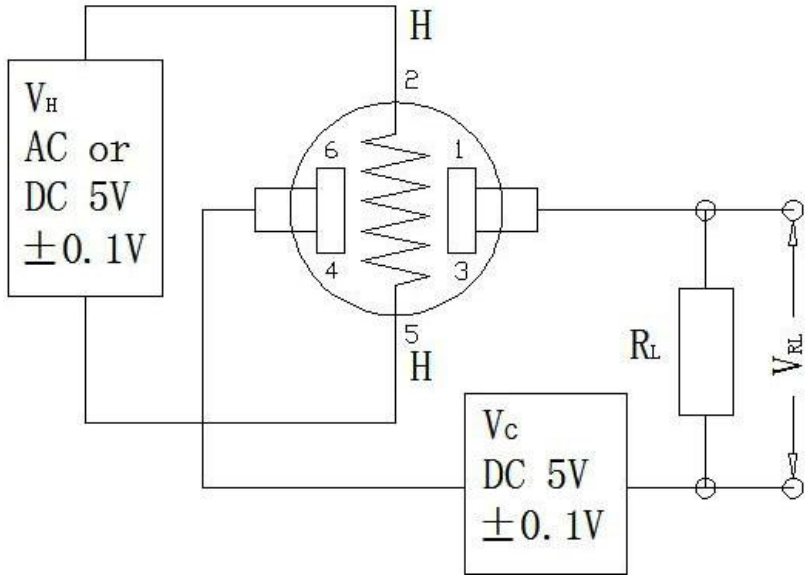
Product Model			MQ-2
Product Type			Semiconductor gas sensors
Standard package			Bakelite, metal cover
Detection gas			Combustible gas, smoke
Detection concentration			300～10000ppm(combustible gas)
standard Circuit condition	Loop voltage	V_C	≤24V DC
	Heating voltage	V_H	5.0V±0.1V AC or DC
	load resistance	R_L	Adjustable
standard test condition	Heating resistor	R_H	29Ω±3Ω (room temperature)
	Heating power consumption	P_H	≤950mW
	Sensitivity	S	Rs(in air)/Rs(2000ppm C_3H_8)≥5
Downward Qi Min Yuan Special sex	Output voltage	Vs	2.5V～4.0V（in 2000ppmC_3H_8)
	Concentration slope	α	≤0.6($R_{3000ppm}$/$R_{1000ppm}$$C_3H_8$)
standard test condition	Temperature and humidity		20℃±2℃; 55%±5%RH
	Standard test circuit		Vc:5.0V±0.1V; V_H:5.0V±0.1V
	Warm-up time		No less than 48 hours



picture1 Sensor structure diagram

Note: Output voltage (Vs) refers to the test atmosphereVRL

Basic Circuit



picture2 MQ-2Test circuit

Note: The figure above is the basic test circuit of MQ-2 sensor. The sensor needs to apply two voltages: heater voltage (V_H) and the test voltage (V_C).That

Medium V_HUsed to provide a specific operating temperature for the sensor, DC power supply or AC power supply can be used.$_{RL}$is the load resistance in series with the sensor (R_L) voltage on the V C

is the load resistance R_LTo provide the test voltage, a DC power supply must be used.

Sensor Characterization

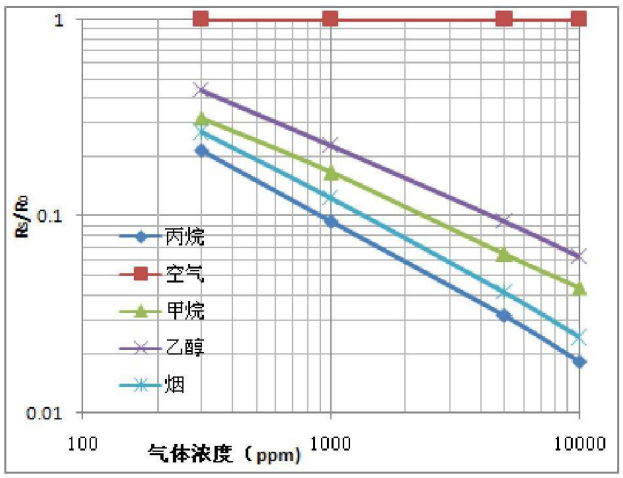


Figure 3 Typical sensitivity characteristic curve of the sensor

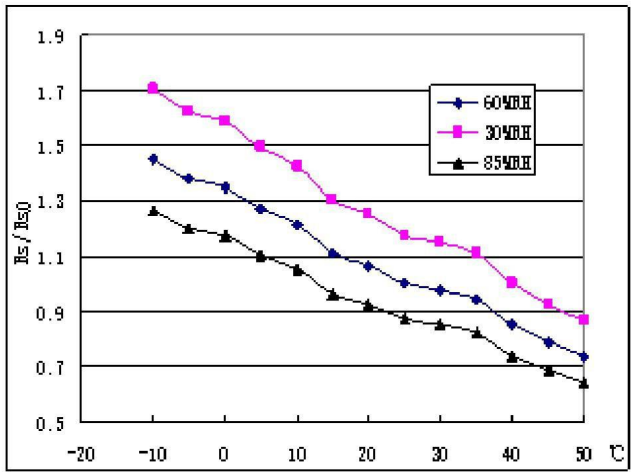


Figure 4 Typical temperature and humidity characteristic curves of the sensor

The vertical axis in the figure is the resistance ratio of the sensor (Rs/R$_0$), the horizontal axis is the gas

Concentration. Rs represents the resistance value of the sensor in different concentrations of gas, R 0

Indicates the resistance value of the sensor in clean air. All tests in the figure are

Completed under standard test conditions.

The vertical axis in the figure is the resistance ratio of the sensor (Rs/R$_{00}$). Rs means

Sensor resistance values at different temperatures and humidities, containing 2000ppm propane.

R_{00}Indicates the transmission under the environmental conditions of 2000ppm propane, 20℃/55%RH

The resistance of the sensor.

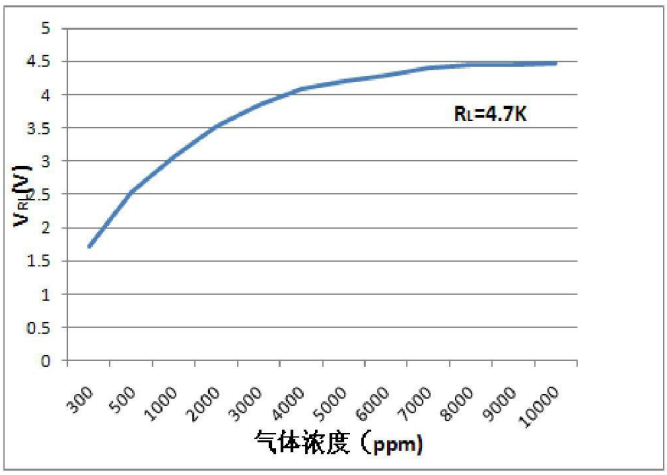


Figure 5 Sensitivity characteristic curve

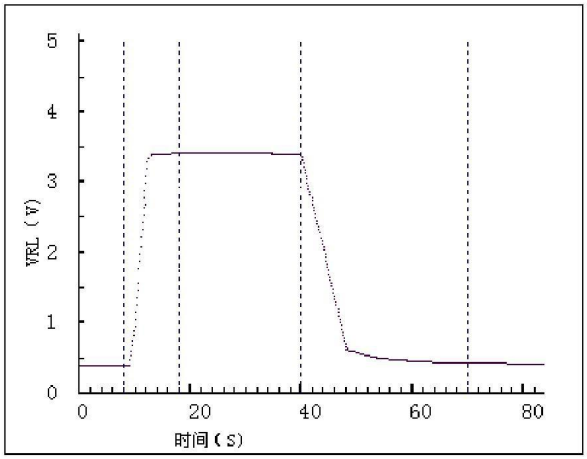


Figure 6 Response recovery characteristic curve

Figure 5 shows the corresponding V load (R_L) is 4.7K. All tests in the figure are completed under standard test conditions.

Figure 6 shows that the sensor is first placed in the detection atmosphere and then removed from the atmosphere. During this process, the sensor's V_{RL} value changes.

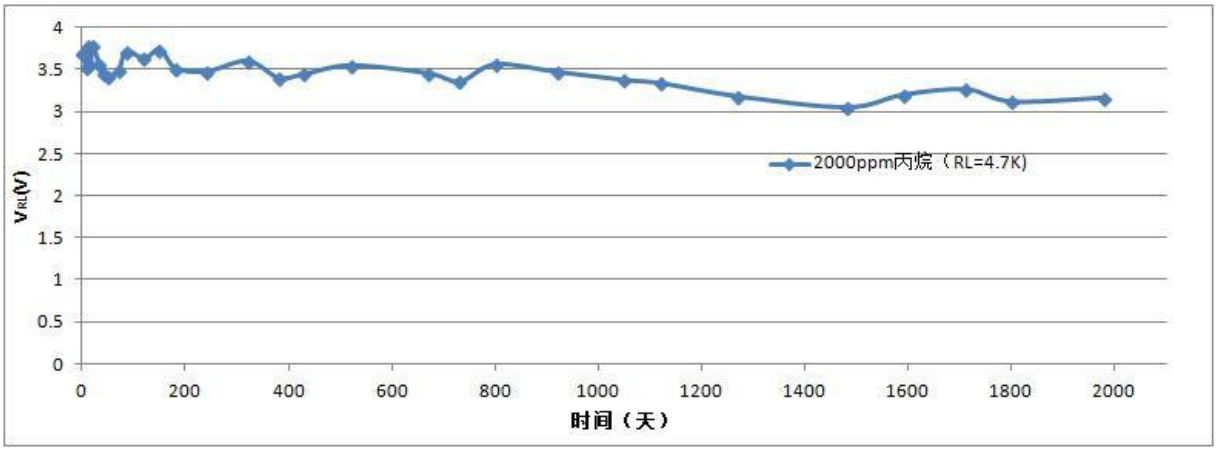


Figure 7 Long-term stability curve

All tests in the figure are completed under standard test conditions. The horizontal axis is the observation time and the vertical axis is V_{RL} value.

Precautions

1 Situations that must be avoided

1.1 Exposure to volatile silicon compound vapors

The sensor should be kept away from places where there are silicone adhesives, hair spray, silicone rubber, putty or other places where there are volatile silicone compounds.

If the surface of the sensor is adsorbed with silicon compound vapor, the sensitive material of the sensor will be wrapped by silicon dioxide formed by the decomposition of the silicon compound.

The sensitivity of the sensor is suppressed and cannot be restored.

1.2 Highly corrosive environment

The sensor is exposed to high concentrations of corrosive gases (such as H_2S, SO_X, Cl_2, HCl, etc.), will not only cause the heating material and the

The corrosion or damage of the sensor leads will cause irreversible deterioration of the performance of the sensitive materials.

1.3 Pollution by alkali, alkali metal salts, and halogens

The performance of the sensor may also deteriorate if it is contaminated by alkali metals, especially salt water spray, or exposed to halogens such as Freon.

1.4 Contact with water

Splashing or immersing the sensor in water will cause the sensor's sensitivity to decrease.

1.5 Freezing

Water freezing on the surface of the sensor's sensitive material will cause the sensitive layer to break and lose its sensitive properties.

1.6 Applied voltage is too high

If a voltage higher than the specified value is applied to the sensor or heater, it may cause

This may damage the leads and/or heater and cause the sensor sensitivity to deteriorate.

1.7 Applying voltage to the wrong pin (only for the indirectly heated series)

For 6-pin sensors, 2 and 5 are heating electrodes, (1, 3)/(4, 6) are test electrodes.

Using electrodes, 1 and 3 are conductive, 4 and 6 are conductive. If voltage is applied to pins 1, 3 or 4, 6

This will cause the lead to burn out, and no signal will be obtained when connected to pins 2 and 4. (See Figure 8 on the right)

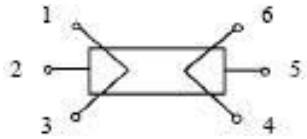


Figure 8: Sensor lead diagram

2 Situations to avoid as much as possible

2.1 Condensate

Under indoor use conditions, slight condensation will have a slight impact on the sensor performance. However, if water condenses on the surface of the sensitive layer

If the surface is exposed to sunlight and remains there for a period of time, the sensor characteristics will degrade.

2.2 In high concentration gas

Regardless of whether the sensor is powered on or not, placing it in high concentration gas for a long time will affect the sensor characteristics.

Towards the sensor, it will cause great damage to the sensor.

2.3 Long-term storage

If the sensor is stored for a long time without power, its resistance will have a reversible drift, which is related to the storage environment.

The sensor should be stored in a sealed bag that does not contain volatile silicon compounds. Sensors that have been stored for a long time need to be ventilated for a longer period of time before use.

The storage time and corresponding aging time recommendations are shown in Table 2.

Table 2

Storage time	Recommended aging time
Under 1 month	No less than 48 hours
1 to 6 months	Not less than 72 hours
6 months and older	Not less than 168 hours

2.4 Long-term exposure to extreme environments

Regardless of whether the sensor is powered on or not, if it is exposed to extreme conditions for a long time, such as high humidity, high temperature or high pollution, the sensor

Performance will be severely affected.

2.5 Frequent vibration or excessive vibration may cause the internal leads of the sensor to resonate and break.

Ultrasonic welders create these vibrations.

2.6 Impact

If the sensor is subjected to a strong impact or dropped, its leads may break.

2.7 Conditions of Use:

2.7.1 Manual soldering is the most ideal soldering method for sensors. The recommended soldering conditions are as follows:

- Flux: Rosin soldering flux with the least chlorine content
- Constant temperature soldering iron
- Temperature: 250℃
- Time: no more than 3 seconds

2.7.2 The following conditions should be met when using wave soldering:

- Flux: Rosin flux with minimal chlorine content
- Speed: (1-2) m/min
- Preheating temperature: (100±20℃
- Soldering temperature: (250±10)℃
- 1 pass through wave soldering machine

Violation of the above usage conditions will degrade the sensor characteristics.