MIX3003 Semiconductor Alcohol Gas Sensor

Version：V1.4

Feature:

*High sensitivity

*Reliable performance

*Low cost

*Long use service

*Small appearance

Application:

*Alcohol alarming in Vehicle

*Portable Alcohol detector

The gas sensing material used in the MIX3003 gas sensor is a semiconductor material with low conductivity in clean air. When there is alcohol vapor in the environment where the sensor is located, the conductivity of the sensor increases with the increase of the alcohol gas concentration in the air. The change in conductivity can be converted into an output signal corresponding to the gas concentration using a simple circuit.

Appearance Dimension:

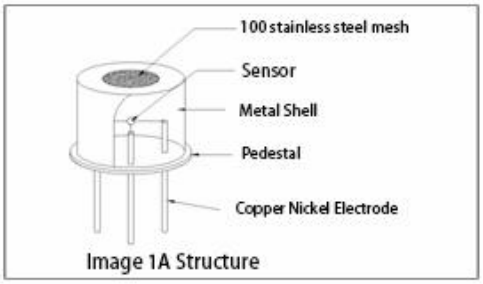


Image 1A Structure

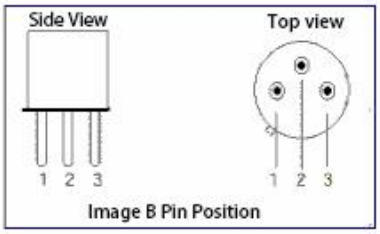


Image B Pin Position

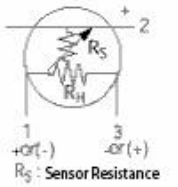
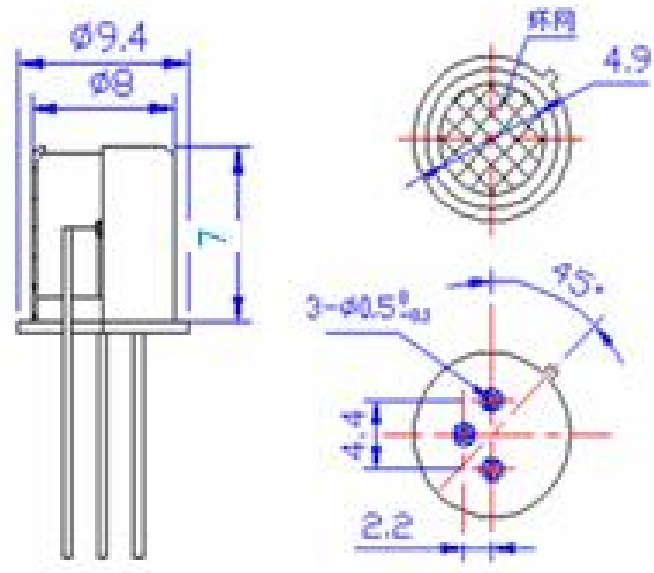
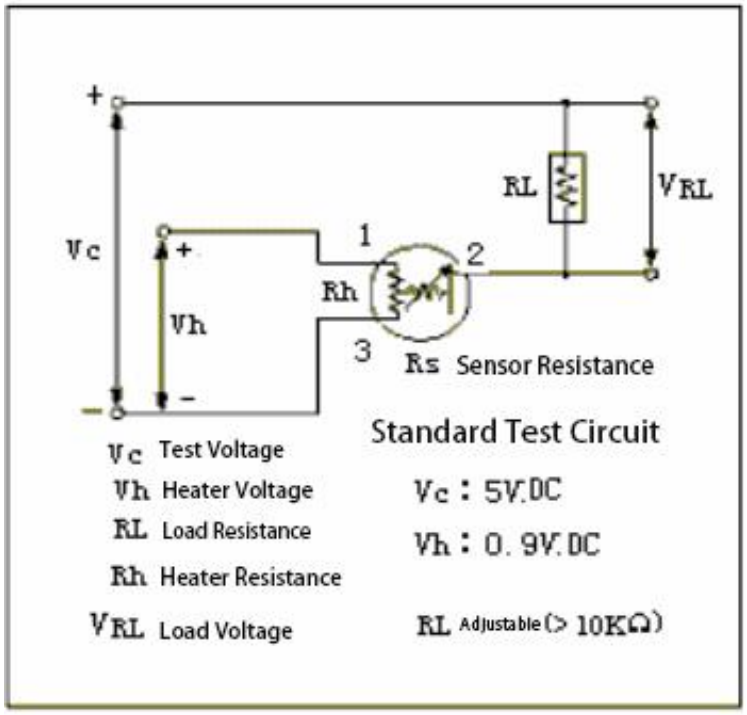


Image C Equivalent Circuit

Test Circuit:





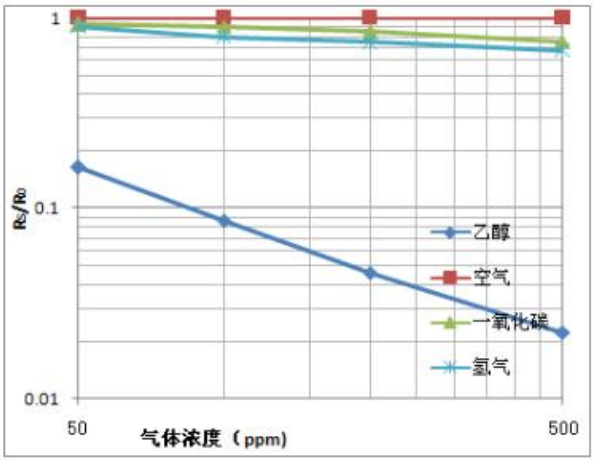
The sensitive part of gas sensor is a miniature sphere with embedded heating wire and metal electrodes, this sensitive element is installed in an explosion-proof double-layer 100 mesh stainless steel shell. (Image 1)

Changes in the concentration of the alcohol gas to be tested will cause changes in the resistance of the sensitive material, which in turn will lead to changes in the voltage on the load resistance. To guarantee the sensor to work well, the heating voltage, loop voltage, and load resistance must meet the standard operation terms shown in Table 1. Before normal detection, a high voltage of 2.2 ± 0.2V should be applied to the sensor for 5-10 seconds, so that the sensor can stabilize and enter the working state as soon as possible.

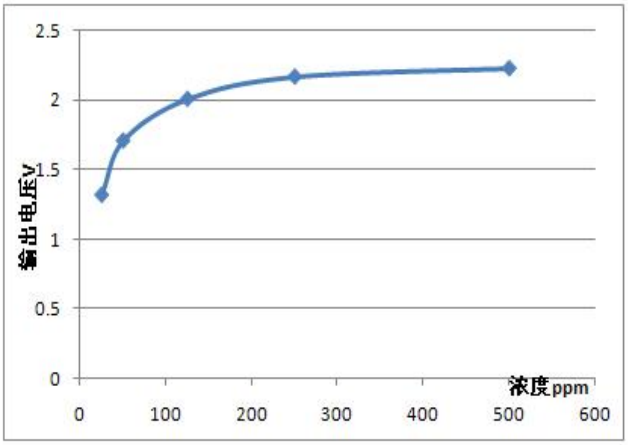
Main Technical Specifications:

Item	Details
Detection Gas	Alcohol Gas
Detection Concentration	25～500ppm
Heating Voltage(VH）	0.9V±0.1V AC or DC
Load Resistance（RL）	Adjustable
Loop Voltage	≤6V DC
Heating Resistance（RH）	4.0Ω±0.5Ω（Room Temp.）
Heating Power(PH)	≤140mW
Resistance of Sensitive Body Surface(R0)	1KΩ～400KΩ(in air)
Sensitivity（S）	R_0(in air)/Rs(in 125ppm alcohol)≥3
Concentration Slope	≤0.6(R300ppm/R50ppm alcohol)
Test Environment	20℃±2℃；55%±5%RH
Standard Test Circuit	Vc:3.0V±0.1V DC ； VH: 0.9V±0.1V DC
Preheating Time	More than 48 hours

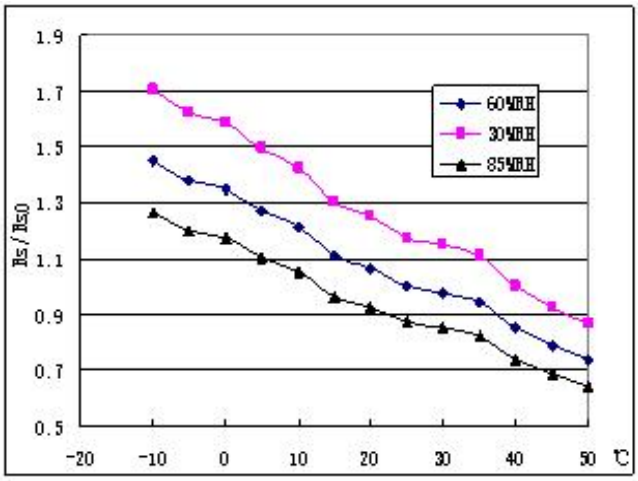
Sensitivity:



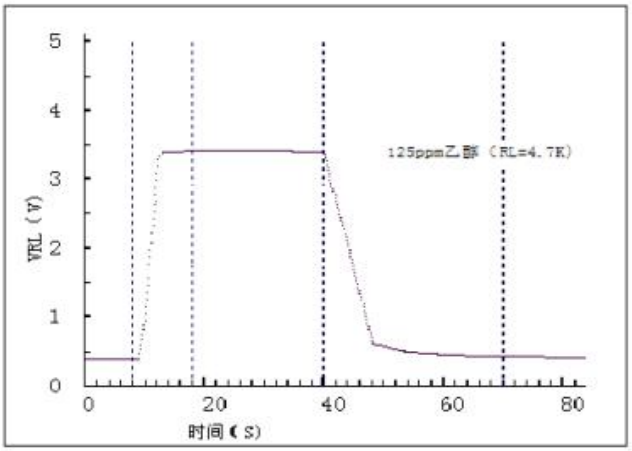
Different Concentration Curves:



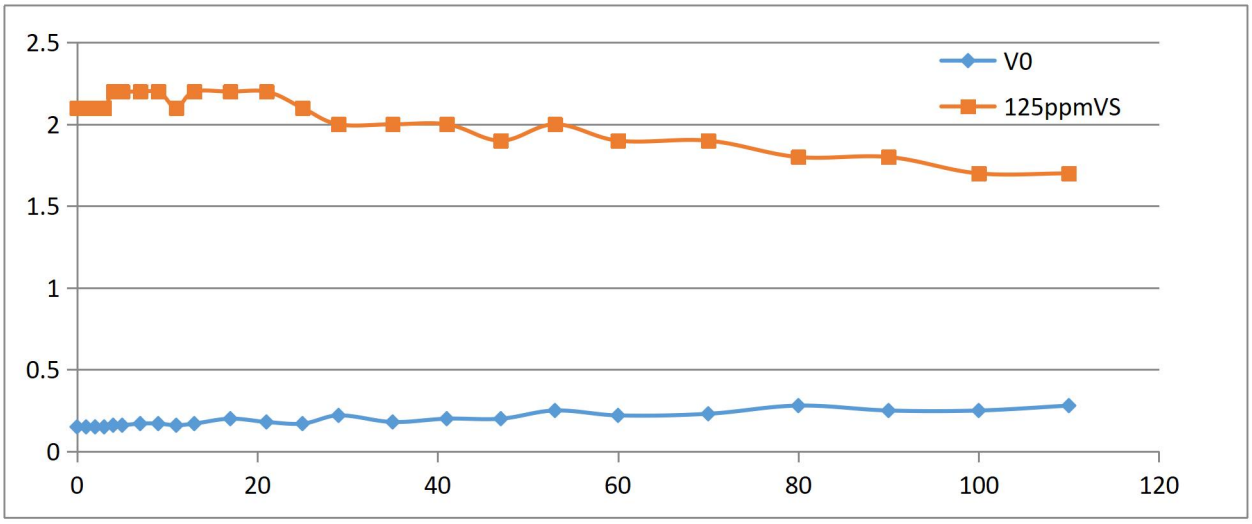
Temperature & Humidity Curve



Response & Recovery Curve



Long Time stability Curve



Cautions:

1. Forbidden exposed the sensor in the organic silicon steam. Sensing material will lose sensitivity and never recover if the sensor absorbs organic silicon steam. The sensor must avoid exposing to silicon bond, fixture, and silicon latex, putty or plastic contain silicon environment.

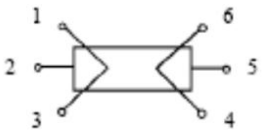
2. Forbidden exposed the sensor in high corrosive gas. If the sensor was exposed to high concentration corrosive gas (e.g. H_2S, SO_X, Cl_2, HCl etc.), it will not only result in corrosion of sensor's structure, also it cause sincere sensitivity attenuation.

3. Forbidden contact to Alkali, Alkali metals salt, halogen pollution. The performance will be changed badly if sensor was polluted by alkali metals salt especially brine, or be exposed to halogen e.g. fluorine.

4. No-contact with the water. No icing on the surface of the sensor.

5. Don't apply with high voltage. When the sensor applied voltage cannot be higher than stipulated value, even if the sensor is not physically damaged or broken, it causes down-line or heater damaged, and bring on sensors' sensitivity characteristic changed badly.

6. Forbidden supply wrong voltage in different pins. Only for 6 pins sensor Pin 2&5 is heating electrodes, Pin (1,3)/(4,6) are testing electrodes (Pin 1 connects with Pin 3, while Pin 4 connects with Pin 6).If apply voltage on Pin 1&3 or 4&6, it will make lead broken; and no signal putout if apply on pins 2&4.



7. Avoid condensation water on the surface of the sensor. Indoor conditions, slight condensation water will influence sensors' performance lightly. However, if condensation water on sensors surface and keep a certain period, sensors' sensitive will be decreased.

8. Avoid using the sensor in high gas concentration. No matter the sensor is electrified or not, if it is placed in high gas concentration for long time, sensors characteristic will be affected. If lighter gas sprays the sensor, it will cause extremely damage.

9. Avoid store the sensor for long time. The sensor's resistance will drift reversibly if it's stored for long time without electrify, this drift is related with storage conditions. Sensor should be stored in airproof bag without volatile silicon compound. For the sensor with long time storage but no electrify, they need long aging time for stability before using. The suggested aging time as follow:

Storage time	Recommend aging time
Less than 1 month	No less than 48 hours
1~6 months	No less than 72 hours
Over 6 months	No less than 168 hours

10. Avoid exposed the sensor in adverse environment for long time. No matter the sensor electrified

or not, if exposed to in adverse environment for long time, e.g. high humidity, high temperature, high pollution etc., it will influence the sensors' performance badly.

11. Avoid vibration and concussion the sensor. If continual vibration the sensors, the down-lead will be break. In transportation or assembling line, pneumatic screwdriver/ultrasonic welding machine can lead this vibration. If concussion the sensor badly, the lead wire will disconnected.

12. Operate the sensor under following condition:

a. Handmade soldering conditions:

Item	Condition
Soldering Flux	Less chlorine
Seaming Iron	Constant temperature
Temperature Of Seaming Iron	250℃
Time Of Soldering	Less than 3 seconds

b. Wave-soldering conditions:

Note: Getting through the soldering machine by once

Item	Condition
Soldering Flux	Less chlorine
Speed	1-2 meter/ minute
Warm-Up Temperature	100±20℃
Soldering Temperature	250±10℃

If did not following above operation terms, the sensor's sensitivity will be decreased

Shenzhen Mixsen Electronics Co., Ltd
Add.: 4A, No. B Building, Dalangyongtai Industrial Park, Huawang Road, Longhua District, Shenzhen, Guangdong, China
Post：518000
Tel：86-755-86635585