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MQ303A Alcohol Sensor

Character

* High sensitivity
* Fast response and resume
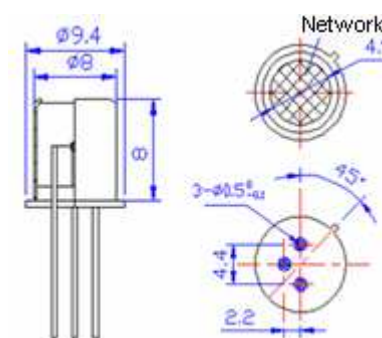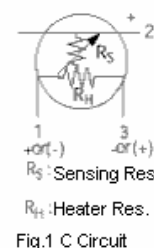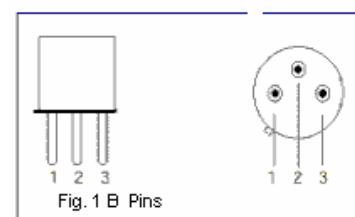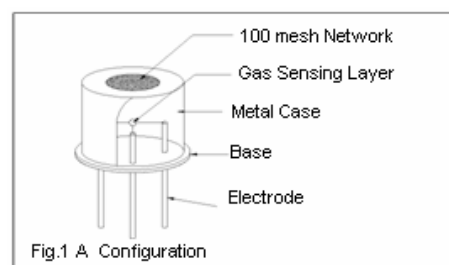* Long life and low cost
* Mini Size

Application

MQ303A is semiconductor sensor is for Alcohol detection, It has good sensitivity and fast response to alcohol, suitable for portable alcohol detector.

Technical Data

Model No.			MQ303A
Sensor Type			Semiconductor
Standard Encapsulation			Metal
Detection Gas			Alcohol
Concentration			20-1000ppm Alcohol
Standard Circuit Conditions	Heater Voltage	V_H	0.9V ± 0.1V　AC or DC
	Loop Voltage	V_c	≤6V DC
	Load Resistance	R_L	Adjustable
	Heater Resistance	R_H	$4.5\Omega \pm 0.5\,\Omega$（Room Tem.）
	Heater Current	I_H	120±20mA
	Heater Power	P_H	≤ 140 mW
Character	Sensor Consumption	P_S	≤10 mW
	Sensing Resistance	R_s	$4K\Omega - 400K\Omega$ (in air)
	Sensitivity	S	Rs(in air)/Rs(125ppm Alcohol)≥3
	Slope	α	0.50 ± 0.15 (R_{300ppm}/R_{100ppm} Alcohol)
Condition	Tem.　Humidity		20℃±2℃；65%±5%RH
	Standard test circuit		V_c:3.0 V±0.1 V DC ; V_H: 0.9 V±0.1 V DC
	Preheat time		Over 48 hours

Configuration

Fig.1 A Configuration

100 mesh Network
Gas Sensing Layer
Metal Case
Base
Electrode

Fig. 1 B Pins

R_S :Sensing Res.
R_H :Heater Res.
Fig.1 C Circuit

Sensing element of the semiconductor sensor is a micro-ball, heater and metal electrode are inside, and the sensing element is installed in anti-explosion double 100 mesh metal case (see the above)
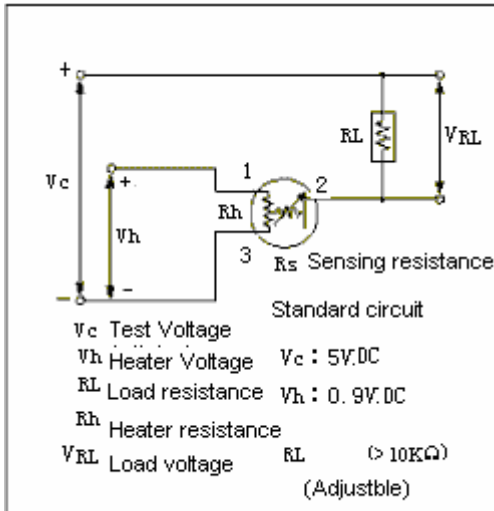
Sensitivity Characteristics

Fig 2 Standard Test Circuit

Influence of Temperature/Humidity

Fig 3 Sensitivity

Fig.2 is the test circuit. You could get resistance change from voltage change on fixed or adjustable load resistance. Normally, it will take several minutes preheating for sensor enter into stable working after electrified; oryou could give 2.2±0.2V high voltage for 5-10secs before test, which make sensor easily stable.
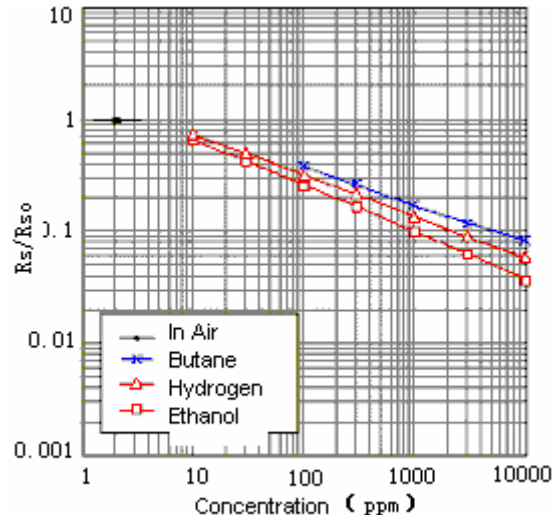
Fig 3 is sensitivy of MQ303A, it reflects relations between resistance and gas concentration, resistance of the sensor reduce when gas concentration increases

Notification

1 Following conditions must be prohibited

1.1 Exposed to organic silicon steam

Organic silicon steam cause sensors invalid, sensors must be avoid exposing to silicon bond, fixature, silicon latex, putty or plastic contain silicon environment

1.2 High Corrosive gas

If the sensors exposed to high concentration corrosive gas (such as H_2Sz, SO_x, Cl_2, HCl etc), it will not only result in corrosion of sensors structure, also it cause sincere sensitivity attenuation.

1.3 Alkali, Alkali metals salt, halogen pollution

The sensors performance will be changed badly if sensors be sprayed polluted by alkali metals salt especially brine, or be exposed to halogen such as fluorin.

1.4 Touch water

Sensitivity of the sensors will be reduced when spattered or dipped in water.

1.5 Freezing

Do avoid icing on sensor'surface, otherwise sensor would lose sensitivity.

1.6 Applied voltage higher

Applied voltage on sensor should not be higher than stipulated value, otherwise it cause down-line or heater damaged, and bring on sensors' sensitivity characteristic changed badly.

1.7 Voltage on wrong pins

For 6 pins sensor, if apply voltage on 1、3 pins or 4、6 pins, it will make lead broken, and without signal when apply on 2、4 pins
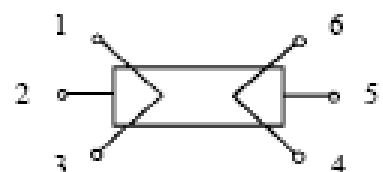
2 Following conditions must be avoided

2.1 Water Condensation

Indoor conditions, slight water condensation will effect sensors performance lightly. However, if water condensation on sensors surface and keep a certain period, sensor' sensitivity   will be decreased.

2.2 Used in high gas concentration
No matter the sensor is electrified or not, if long time placed in high gas concentration, if will affect sensors characteristic.

2.3 Long time storage
The sensors resistance produce reversible drift if it's stored for long time without electrify, this drift is related with storage conditions. Sensors should be stored in airproof without silicon gel bag with clean air. For the sensors with long time storage but no electrify, they need long aging time for stbility before using.

2.4 Long time exposed to adverse environment
No matter the sensors electrified or not, if exposed to adverse environment for long time, such as high humidity, high temperature, or high pollution etc, it will effect the sensors performance badly.

2.5 Vibration
Continual vibration will result in sensors down-lead response then repture. In transportation or assembling line, pneumatic screwdriver/ultrasonic welding machine can lead this vibration.

2.6 Concussion
If sensors meet strong concussion, it may lead its lead wire disconnected.

2.7 Usage
For sensor, handmade welding is optimal way. If use wave crest welding should meet the following conditions:
2.7.1   Soldering flux: Rosin soldering flux contains least chlorine
2.7.2   Speed: 1-2 Meter/ Minute
2.7.3   Warm-up temperature：100±20℃
2.7.4   Welding temperature：250±10℃
2.7.5   1 time pass wave crest welding machine
If disobey the above using terms, sensors sensitivity will be reduced.