麦芽传感科技
Maiya Sensor Technology

Smell sensor

MST136

Product instruction manual

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Product overview

MST136 air quality (odor) sensor has the advantages of high sensitivity, low cost, long life and low power consumption. It is a broad spectrum gas sensor with high sensitivity to many trace reduction gases (or micro-toxic gas molecules). These gas molecules include, Ammonia, hydrogen, alcohol, carbon monoxide, methane, propane, glycerine, styrene, propylene glycol, phenol, toluene, ethylbenzene, xylene, formaldehyde and other organic volatile gases, cigarette, wood, paper burning smoke, soot, etc.

MST136 type air quality (odor) sensor belongs to metal oxide planar semiconductor sensor, which is made of nano SnO2 powder and catalyst doping and sintering. When there is a trace of reducing pollution gas in the air, the conductivity of the sensor will increase. The change of conductance increases with the increase of pollution gas concentration. By the amount of conductivity change, the sensor can sense the degree of air pollution. For example, when there is a second-hand smoke or cosmetics volatile molecules, the sensor can produce conductivity changes. Using this sensitive characteristic of the sensor, and then through the simple single chip microcomputer control, we can realize the intelligent start of exhaust ventilation equipment, so as to achieve the effect of intelligent indoor air purification.

MST136 type air quality (odor) sensor has a very wide range of applications, such as family, hospital, dinner/hotel, conference room, reception room, hotel, car/train station waiting hall, chess room, club, etc. These occasions will often appear formaldehyde, second-hand smoke, alcohol and other air pollutants, in this case, the intelligent air purification system can automatically start. It can also be widely applied to the Internet of Things to sense the air quality status of a certain space in the Internet of Things and realize the air quality monitoring within the scope of the Internet of Things.

Features:

- ✧ Low power consumption
- ✧ Long life
- ✧ Low cost
- ✧ Small size
- ✧ High sensitivity to low concentration pollution gas
- ✧ Simple application circuit
- ✧ High consistency

Main applications:

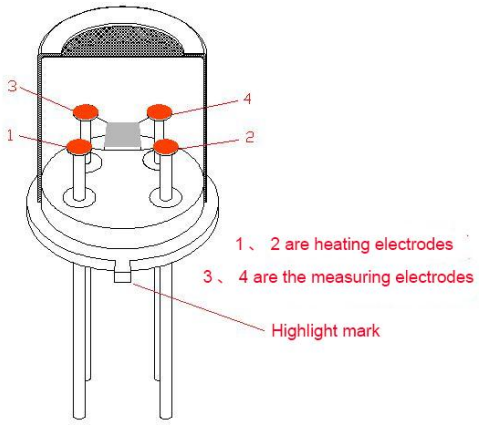
- ✧ Air quality tester and module
- ✧ Indoor exhaust fan Ventilation fan control module
- ✧ Air quality (odor) monitoring module and smart
- ✧ Odor detection module for lighting
- ✧ Air purifier, plasma purifier automatic control module

Specification

Model number			MST136	
Packaging standard			Metal TO-05	
Detection gas			Hydrogen, alcohol, smoke, etc	
Detection range			0-200PPM(alcohol) 0-10PPM(formaldehyde) 0-10000PPM(natural gas) 0-4000PPM(Hydrogen)	
Standard loop	Heating voltage	V_H	5.0±0.2V DC/AC	
Component characteristics under standard test conditions	Heating voltage	V_H	5.0±0.2V DC	Ps≤15mW
	Loop voltage	V_C	Adjustable	Ps≤15mW
	Load resistance	R_L	85Ω±10Ω(room temperature)	
	Heater resistance	R_H	55mA±5mA	
	Heating sheet current	I_H	260mW±10mW	
	Sensitivity change		>0.5V	10PPM(ethanol)
Under standard test conditions	Temperature and humidity		20±2℃,65±5%RH	
	Preheating time		No less than 24 hours	
	Response time		≤30s	
	Desorption time		≤60s	

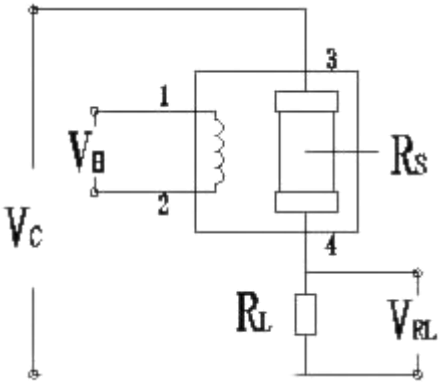
Pin definition

The planar device structure is shown in the figure. A heating wire is stabilized on a ceramic sheet, a gold electrode lead is connected at both ends, and a semiconductor-sensitive material is coated between the two electrodes. The heating material can heat the entire ceramic sheet to 200-400℃, so that the sensor can reach the required operating temperature. The opposite electrode on the outside of the tube core can measure the electrical characteristics of the material in real time. The corresponding figure of the welding leads of the sensor is shown in the figure. There is a prominent marker on the lead seat. Pins 1 and 2 adjacent to the mark are heating wire pins, and pins 3 and 4 are sensor signal pins.

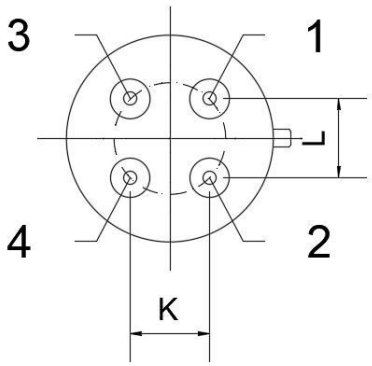


Basic circuit

Sensor 1, 2 pins are connected to the heating circuit, 3, 4 pins are connected to the measuring circuit; Under the premise of meeting the electrical performance requirements of the sensor, the heating and measurement can share the same power circuit. Note: Note the prominent mark on the sensor. The two tube feet next to the mark are heating electrodes.

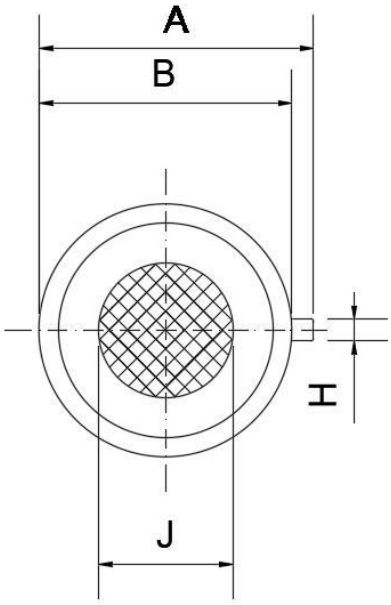


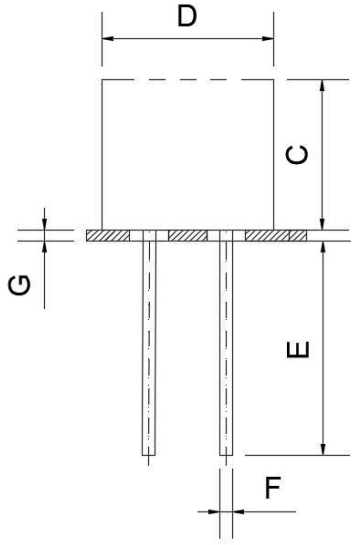
Structure drawing



Pin connection:

1. Heating circuit
2. Heating circuit
3. Measurement circuit
4. Measurement circuit





A:10.22	B:9.4	C:7	D:8	E:10	F:0.6	G:0.52	H:0.8	J:5	K:3.6	L:3.6

Size unit: mm, tolerance ±0.2mm

Attention

1. Must avoid the situation

1.1 Exposure to silicone vapors

If silicone vapor is adsorbed on the surface of the sensor, the sensitive material of the sensor will be coated, inhibiting the sensitivity of the sensor, and can not be recovered. Sensors should be protected from exposure to silicone adhesives, hairspray, silicone rubber, putty, or other silicon-containing plastic additives where they may be present.

1.2 Highly corrosive environment

Exposure of sensors to high concentrations of corrosive gases (such as H2S, SOX, Cl2, HCl, etc.) will not only cause corrosion or damage of heating materials and sensor leads, but also lead to irreversible changes in the properties of sensitive materials.

1.3 The pollution sensor of alkali, alkali metal salt and halogen is polluted by alkali metal, especially brine spray, and exposure to halogen such as fluorine will also cause deterioration in performance.

1.4 Exposure to water

Splashing or immersion in water will cause a decrease in sensitivity.

1.5 Icing

Water icing on the surface of the sensitive element will cause the sensitive material to crumble and lose sensitive properties.

1.6 The applied voltage is too high

If the voltage applied to the sensor or heater is higher than the specified value, even if the sensor is not physically damaged or destroyed, it will cause damage to the lead and/or heater and cause degradation of the sensor sensitivity.

2. Situations that can be avoided

2.1 Condensate

Under indoor conditions, slight condensation will have a slight impact on the sensor performance. However, if water condenses on the surface of the sensor and remains there for a period of time, the sensor characteristics will be degraded.

2.2 In a high concentration of gas

Whether the sensor is energized or not, long-term placement in high concentration gas will affect the characteristics of the sensor.

2.3 Long-term storage

When the sensor is stored without power for a long time, its resistance will produce reversible drift, which is related to the storage environment. The sensor should be stored in a sealed bag with

clean air and no silicone. Sensors that have been stored for a long time need to be energized for a long time before use to stabilize them.

2.4 Long-term exposure to extreme environments

Whether the sensor is powered on or not, the sensor performance will be seriously affected if it is exposed to extreme conditions for a long time, such as high humidity, high temperature, or high pollution.

2.5 Vibration

Frequent and excessive vibration will lead to resonance of the sensitive element and fracture. The use of pneumatic screwdriver/ultrasonic welders in transit and on the assembly line will produce this vibration.

2.6 Impact

If the sensor is strongly impacted, its lead will be broken.

2.7 Use

Manual welding is the most ideal welding method for sensors. The use of wave soldering should meet the following conditions:

2.7.1 Flux: rosin flux with least chlorine

2.7.2 Speed: 1-2 m/min

2.7.3 Preheating temperature: 100±20℃

2.7.4 Welding temperature: 250±10℃

2.7.5 Pass the wave crest welder once

Violation of the above conditions will degrade the sensor characteristics!

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