

# TECHNICAL DATA

# MQ-5 GAS SENSOR

## FEATURES

- \* High sensitivity to LPG, natural gas , town gas
- \* Small sensitivity to alcohol, smoke.
- \* Fast response .      \* Stable and long life      \* Simple drive circuit

## APPLICATION

They are used in gas leakage detecting equipments in family and industry, are suitable for detecting of LPG, natural gas , town gas, avoid the noise of alcohol and cooking fumes and cigarette smoke.

## SPECIFICATIONS

### A. Standard work condition

| Symbol         | Parameter name      | Technical condition | Remarks  |
|----------------|---------------------|---------------------|----------|
| V <sub>c</sub> | Circuit voltage     | 5V±0.1              | AC OR DC |
| V <sub>H</sub> | Heating voltage     | 5V±0.1              | AC OR DC |
| P <sub>L</sub> | Load resistance     | 20KΩ                |          |
| R <sub>H</sub> | Heater resistance   | 31±10%              | Room Tem |
| P <sub>H</sub> | Heating consumption | less than 800mw     |          |

### B. Environment condition

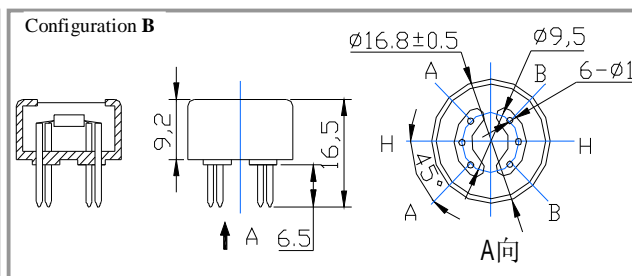
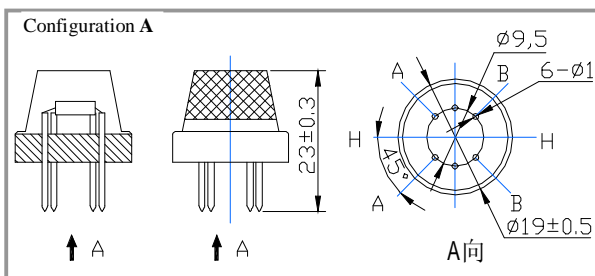
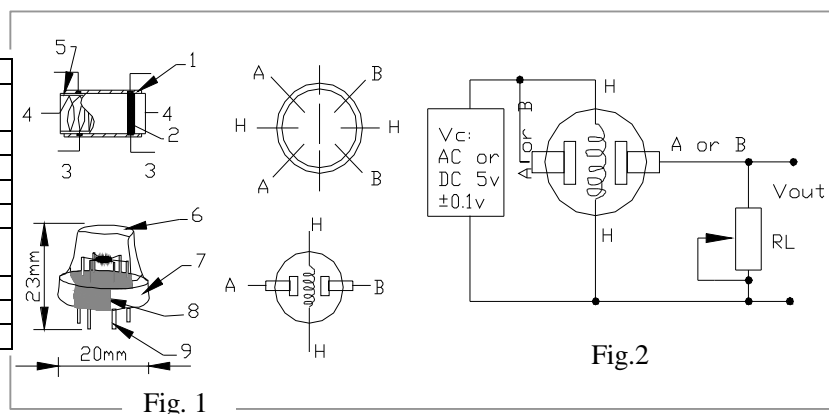
| Symbol          | Parameter name       | Technical condition  | Remarks                  |
|-----------------|----------------------|--|--------------------------|
| T <sub>ao</sub> | Using Tem            | -10℃-50℃   |                          |
| T <sub>as</sub> | Storage Tem          | -20℃-70℃   |                          |
| R <sub>H</sub>  | Related humidity     | less than 95% Rh   |                          |
| O <sub>2</sub>  | Oxygen concentration | 21%(standard condition)Oxygen concentration can affect sensitivity | minimum value is over 2% |

### C. Sensitivity characteristic

| Symbol                                   | Parameter name                       | Technical parameter                 | Remarks  |
|--|--------------------------------------|-------------------------------------|--|
| Rs                                       | Sensing Resistance                   | 10K Ω - 60K Ω<br>(5000ppm methane ) | Detecting concentration scope:<br>200-10000ppm<br>LPG,LNG<br>Natural gas,<br>iso-butane, propane<br>Town gas |
| α<br>(5000ppm/1000 ppm CH <sub>4</sub> ) | Concentration slope rate             | ≤0.6                                |  |
| Standard detecting condition             | Temp: 20℃ ± 2℃<br>Humidity: 65% ± 5% | Vc: 5V ± 0.1<br>Vh: 5V ± 0.1        |  |
| Preheat time                             | Over 24 hour                         |                                     |  |

### D. Strucyure and configuration, basic measuring circuit

|   | Parts                  | Materials                               |
|---|------------------------|---|
| 1 | Gas sensing layer      | SnO <sub>2</sub>                        |
| 2 | Electrode              | Au                                      |
| 3 | Electrode line         | Pt                                      |
| 4 | Heater coil            | Ni-Cr alloy                             |
| 5 | Tubular ceramic        | Al <sub>2</sub> O <sub>3</sub>          |
| 6 | Anti-explosion network | Stainless steel gauze (SUS316 100-mesh) |
| 7 | Clamp ring             | Copper plating Ni                       |
| 8 | Resin base             | Bakelite                                |
| 9 | Tube Pin               | Copper plating Ni                       |



Structure and configuration of MQ-5 gas sensor is shown as Fig. 1 (Configuration A or B), sensor composed by

micro  $Al_2O_3$  ceramic tube, Tin Dioxide ( $SnO_2$ ) sensitive layer, measuring electrode and heater are fixed into a crust made by plastic and stainless steel net. The heater provides necessary work conditions for work of sensitive components. The enveloped MQ-5 have 6 pin ,4 of them are used to fetch signals, and other 2 are used for providing heating current.

Electric parameter measurement circuit is shown as Fig.2

#### E. Sensitivity characteristic curve

Fig.2 sensitivity characteristics of the MQ-5

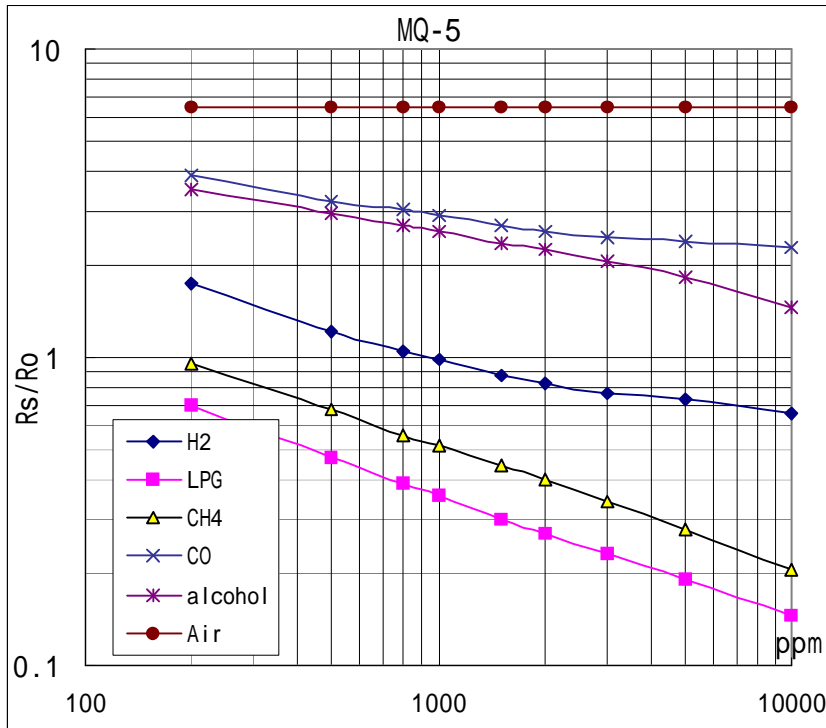


Fig.3 is shows the typical sensitivity characteristics of the MQ-5 for several gases.

in their: Temp: 20°C、

Humidity: 65%、

O<sub>2</sub> concentration 21%

RL=20k  $\Omega$

Ro: sensor resistance at 1000ppm of H<sub>2</sub> in the clean air.

Rs: sensor resistance at various concentrations of gases.

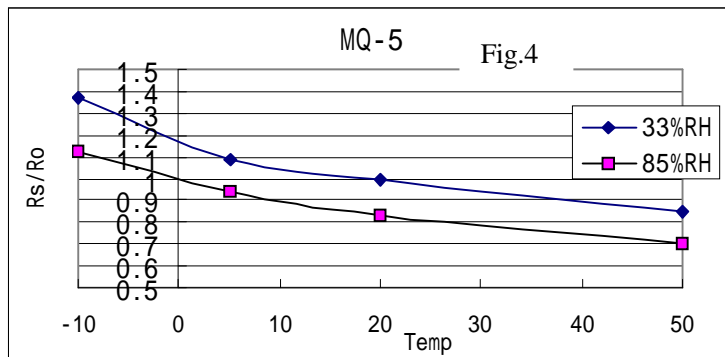


Fig.4 is shows the typical dependence of the MQ-5 on temperature and humidity.

Ro: sensor resistance at 1000ppm of H<sub>2</sub> in air at 33%RH and 20 degree.

Rs: sensor resistance at different temperatures and humidities.

#### SENSITIVITY ADJUSTMENT

Resistance value of MQ-5 is difference to various kinds and various concentration gases. So, When using this components, sensitivity adjustment is very necessary. we recommend that you calibrate the detector for 1000ppm H<sub>2</sub> or LPG concentration in air and use value of Load resistance ( $R_L$ ) about 20 K  $\Omega$  (10K  $\Omega$  to 47K  $\Omega$ ).

When accurately measuring, the proper alarm point for the gas detector should be determined after considering the temperature and humidity influence.