

# MP135 For Air contaminants Detection

MP135 model with advanced planar construction is comprised of heater and metal oxide semiconductor material of subminiature  $Al_2O_3$  ceramic plate, fetch out electrode down-lead, encapsulation in metal base and cap. When the target gas exist , The sensor's conductivity is more higher along with the gas concentration rising. Please use simple electrocircuit, Convert change of conductivity to correspond output signal of gas concentration.

## Features:

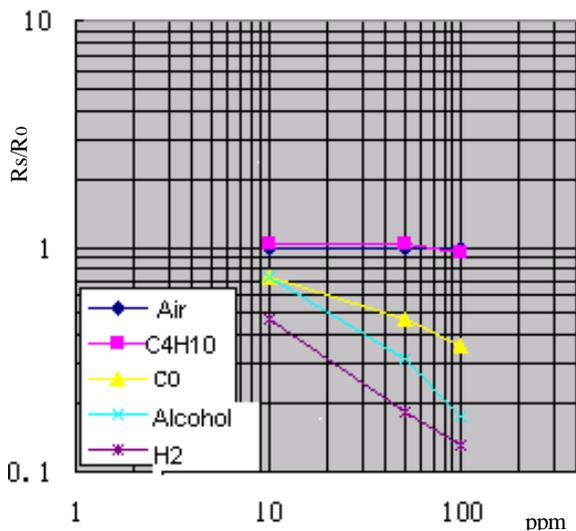
- \* High Sensitivity to  $H_2$
- \* Small size
- \* 5V steady voltage, low powerconsumption
- \* Fast response and resume
- \* Simple Drive circuit
- \* High stability and long life

## Application

Widely used in family , bad gas detection, automatic air exhaust, air fresher.

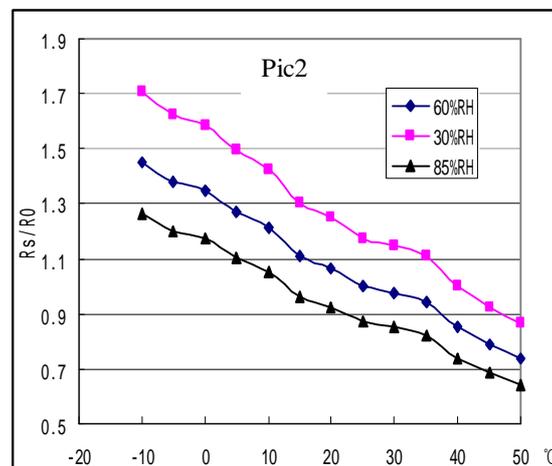


## Sensitivity Characteristics:



Pic 1 is typical sensitivity characteristics. Ordinate is sensor's resistance ratio ( $R_s/R_o$ ) Abscissa is gas concentration.  $R_s$  is a resistance In different gas concentration.  $R_o$  is In 50ppm  $H_2$  Resistance. All the testing is finished in standard Testing condition.

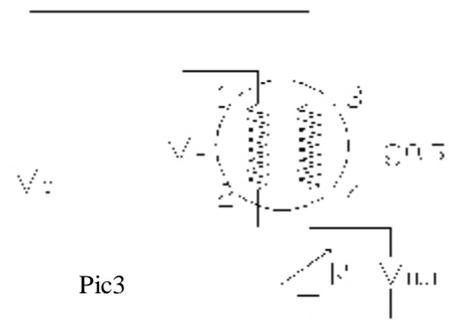
## Temperature/Humidity Dependency:



Pic 2 is typical temperature and humidity depency. Ordinate is sensor's resistance ratio ( $R_s/R_o$ ) Abscissa is testing temperature.  $R_s$  is a resistance In 50ppm  $H_2$  and a variety of temperature / Humidity .  $R_o$  is In a resistance 50ppm  $H_2$  and  $20^\circ C/65\%RH$ .

## Basic measuring circuit:

Pic 3 is a basic measuring circuit of a sensor. This sensor need to add 2 voltage: Heater voltage ( $V_H$ ) and measuring voltage ( $V_C$ ) ;  $V_H$  Is a given working temperature applied for sensor.  $V_C$  is measuring ( $V_{RL}$ ) of load resistance ( $R_L$ ) which is in series with the sensor. This sensor have light polarity ,  $V_C$  need to use DC power . On the premise of satisfy with sensors electrical property demand,  $V_C$  and  $V_H$



may use a same power circuit . In order to use the sensor' s performance, need to choose suitable  $R_L$ .

**Specifications:**

A. standard working conditions

Symbol	Parameter Name	Technical condition	Remark
$V_c$	Loop Voltage	$\leq 24V$	DC
$V_H$	Heater Voltage	$5.0V \pm 0.2V$	AC or DC
$R_L$	Loading Resistance	Adjusted	
$R_H$	Heating Resistance	$130\Omega \pm 20\Omega$	Room Temperature
$P_H$	Heating Power Consumption	$\leq 240mW$	

B. Environment Conditions

Symbol	Parameter Name	Technical condition	Remark
$T_{ao}$	Using Temperature	$-10^\circ C - +50^\circ C$	
$T_{as}$	Storage Temperature	$-20^\circ C - +70^\circ C$	
RH	Relative Humidity	Less than 95% RH	
$O_2$	Oxygen Concentration	21%(Standard conditions) Oxygen Concentration can impact to sensitivity speciality	Least more than 2 %

C. Sensitivity Speciality

Symbol	Parameter Name	Technical condition	Remark
$R_s$	Sensitivity face resistance	$10K\Omega - 100K\Omega$ (50ppm $H_2$ )	Suitable range: 10-1000ppm $H_2$ 10-1000Alcohol 10-500ppmCO
S	Sensitivity(50ppm $H_2$ )	$R_{in\ air} / R_{in\ typical\ gas} \geq 3$	
Standard Working Conditions	$V_c: 5.0V \pm 0.2V$ $V_H: 5.0V \pm 0.2V$ Temperature: $20^\circ C \pm 2^\circ C$ Relative Humidity: $65\% \pm 5\%$		
Preheating Time	More than 48 hours		

Sensitivity consumption ( $P_s$ ) calculate formula:  $P_s = V_c^2 \times R_s / (R_s + R_L)^2$

Sensor resistance ( $R_s$ ) calculate formula:  $R_s = (V_c / V_{RL} - 1) \times R_L$

D. Structure and configuration

Please view Pic 4, MP135 is comprised of subminiature  $Al_2O_3$  ceramic plate,  $SnO_2$  sensitivity layer, Heater, sensitivity components with heater and measuring electrode fixed in the metal antrum, Heater supplied a necessary work conditions. The sensor with encapsulation have 4 needle shape pin, two of them (1#, 2#) is used to supply heating current, (3#, 4#) is used to signal output.

