

TGS2612 Gas Sensor for Detecting Methane and LP

characteristic :

- * low power consumption
- * The sensitivity of methane gas and LP gas is almost the same at the same%LEL level
- * Long service life and low cost
- * Simple application circuit

apply :

- * Household LNG and LPG leak alarm
- * Portable combustible gas leak detector
- * LNG and LPG detectors

The sensor element consists of an integrated heater and a metal oxide semiconductor on an alumina substrate. When the detected gas is present in the air, its concentration increases, thereby raising the sensor's conductivity. A simple circuitry converts these conductivity changes into corresponding signal outputs that directly reflect the gas concentration levels.

The TGS2612 sensor demonstrates exceptional sensitivity to methane, propane, and butane gases, making it the optimal choice for LNG and LPG applications. Its low sensitivity to volatile alcohol (a common environmental interference gas) positions it as an ideal solution for gas leak detection systems in consumer markets. Featuring a compact design with a heater current of just 56mA and a standard TO-5 metal housing, this sensor delivers both performance and portability.

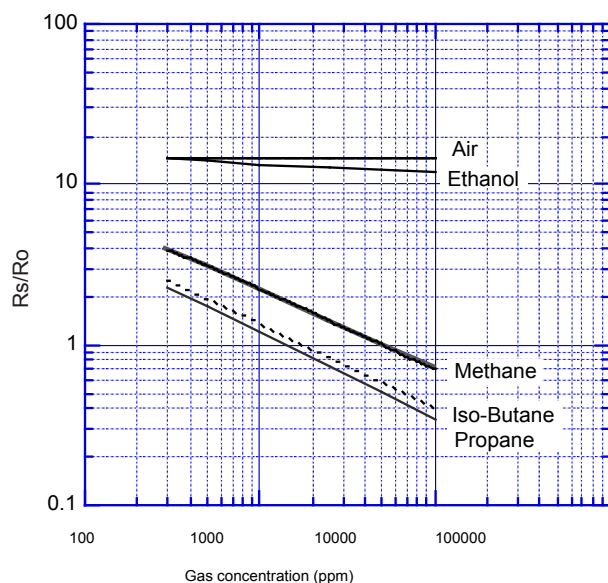


Sensitivity characteristics:

The representative sensitivity characteristic curve is shown in the figure below under standard test conditions (see back).

The vertical axis shows the sensor resistance ratio R_s / R_o , where R_s and R_o are defined as follows:

R_s = resistance of the sensor in various concentrations of gas
 R_o = resistance of the sensor in 5000ppm methane



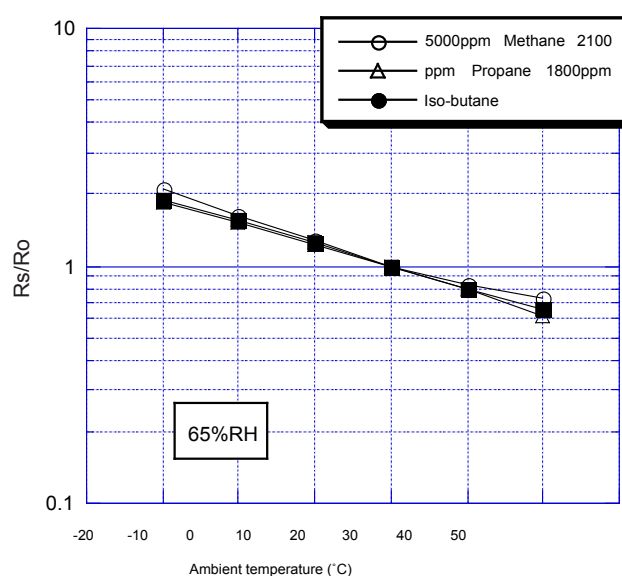
Temperature and humidity characteristics:

The following figure shows the representative characteristic curve affected by temperature and humidity.

The vertical axis shows the sensor resistance ratio R_s / R_o , where R_s and R_o are defined as follows:

R_s = Resistance of the sensor at 10%LEL level of each gas under various temperature and humidity conditions.
 R_o = Resistance of the sensor at 10%LEL level of each gas under temperature and humidity of 20°C, 65%

R.H. Air resistance value

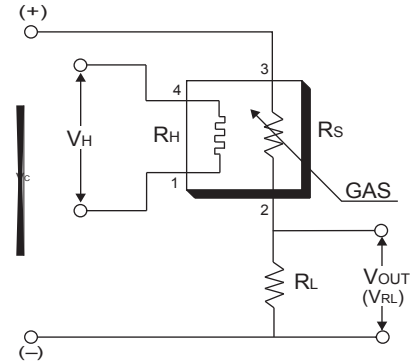


Important Notice: The application conditions for Feigaro sensors may vary depending on specific customer requirements. Feigaro strongly recommends consulting our technical team prior to use, particularly when the detected gas is not listed. Feigaro shall not be held liable for any unauthorized usage that has not undergone professional testing by Feigaro.

Basic test circuit:

This sensor requires both heater voltage (V_H) and loop voltage (V_C). V_H is applied to the integrated heater to maintain the sensor element at a temperature compatible with the target gas. V_C measures the loop output voltage (V_{RL}) across the load resistor (R_L) connected in series with the sensor.

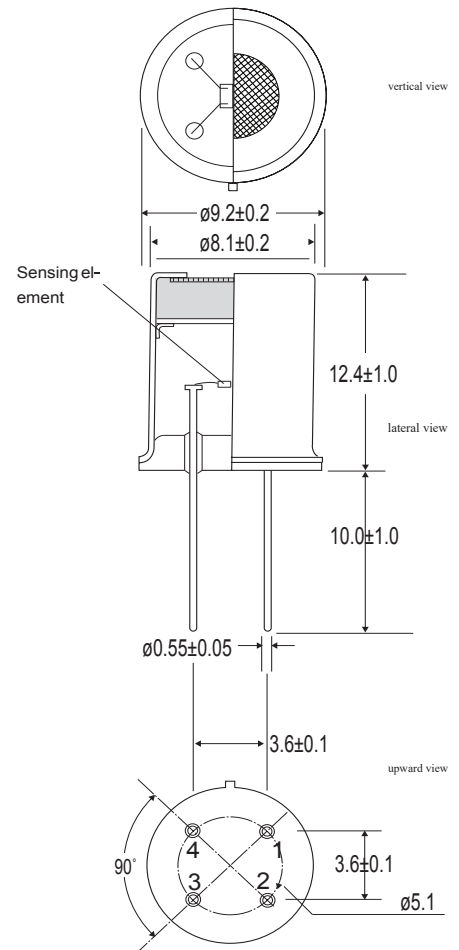
This sensor has polarity requirements, so the circuit must be powered by DC. As long as the electrical characteristics of the sensor are satisfied, V_C and V_H can share the same power supply circuit. When selecting load resistance, choose values that provide optimal response range for the detected gas concentration. Additionally, ensure the maximum power consumption (P_S) of the sensor components remains below 15mW under the maximum load resistance values (R_L) within the detected gas concentration range. The maximum power consumption occurs when the resistance value of R_L exposed to gas equals that of R_S .



specifications :

model		TGS2612	
Detection principle		Oxidized semiconductor type	
Standard encapsulation		TO-5 Metals	
Object gas		Methane, propane, isobutane	
Scope of detection		Each gas 1 ~ 25%LEL	
Standard loop conditions	heater voltage	V_H	$5.0 \pm 0.2V$ AC/DC
	loop voltage	V_C	$5.0 \pm 0.2V$ DC $P_S \leq 15mW$
	load resistance	R_L	variable $0.45k\Omega$ min.
Electrical characteristics under standard test conditions	Heating element resistance	R_H	Room temperature about 59Ω
	Heater current	I_H	$56 \pm 5mA$
	Heater power consumption	P_H	$280mW$ $V_H=5.0V$ DC
	Sensor resistor	R_S	$0.68 \sim 6.8k\Omega$ 5000 ppm methane in
	Sensitivity (rate of change of R_S)		$0.50 \sim 0.65$ $\frac{R_S(9000ppm)}{R_S(3000ppm)}$
standard test conditions	Test gas conditions	Methane, propane, and isobutane in air $20 \pm 2. C, 65 \pm 5\%R.H.$	
	Loop conditions	$V_C = 5.0 \pm 0.01V$ DC $V_H = 5.0 \pm 0.05V$ DC	
	preheating time	7 sky	

Structure and size:



Pin connections:

Unit : mm

- 1: Heater
- 2: Sensor electrode (-)
- 3: Sensor electrode (+)
- 4: Heater

The power consumption value (P_S) can be calculated by the following formula: The sensor resistor (R_S) depends on V_{OUT} (V_{RL})
The measured value is calculated by the following formula:

$$P_S = \frac{(V_C - V_{RL})^2}{R_S}$$

$$R_S = \left(\frac{V_C}{V_{RL}} - 1 \right) \times R_L$$

The typical characteristics of the sensor are shown in this product specification. The actual characteristics of the sensor vary from product to product. Please refer to the specifications for each sensor.

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