

## TGS 2610 - for the detection of LP Gas

### Features:

- \* Low power consumption
- \* High sensitivity to LP and its component gases (e.g. propane and butane)
- \* Long life and low cost
- \* Uses simple electrical circuit

### Applications:

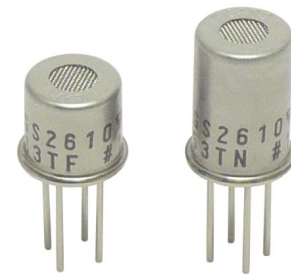
- \* Residential LP leak detectors and alarms
- \* Portable LP detectors
- \* LP gas and vapor detection

**TGS2610** is a semiconductor type gas sensor which combines very high sensitivity to LP gas with low power consumption and long life. Due to miniaturization of its sensing chip, TGS2610 requires a heater current of only 56mA and the device is housed in a standard TO-5 package.

The TGS2610 is available in two different models which have different external housings but identical sensitivity to LP gas. Both models are able to satisfy the requirements of performance standards such as UL1484 and EN50194.

**TGS2610-C00** possesses small size and quick gas response, making it suitable for gas leakage checkers.

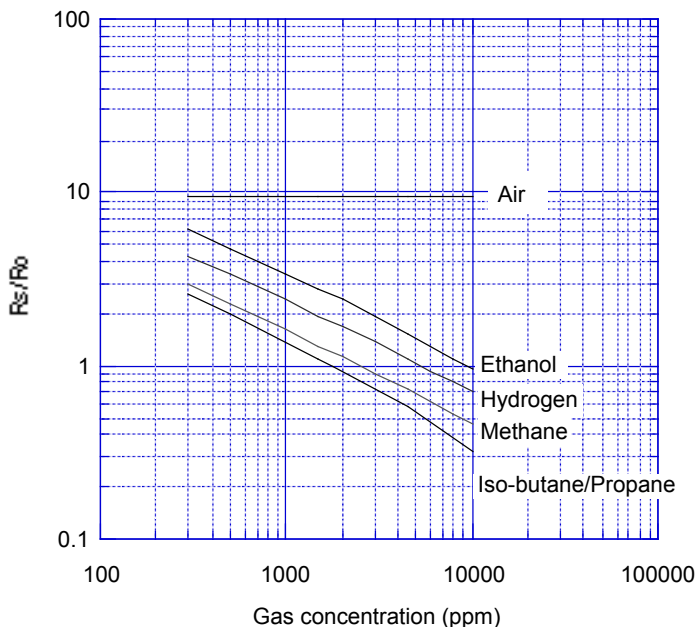
**TGS2610-D00** uses filter material in its housing which eliminates the influence of interference gases such as alcohol, resulting in highly selective response to LP gas. This feature makes the sensor ideal for residential gas leakage detectors which require durability and resistance against interference gas.



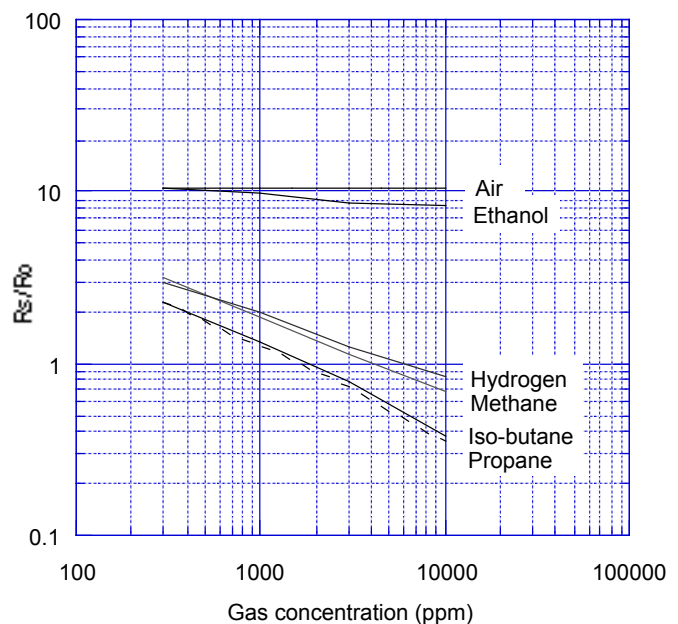
The figure below represents typical sensitivity characteristics, all data having been gathered at standard test conditions (see reverse side of this sheet). The Y-axis is indicated as sensor resistance ratio ( $R_s/R_o$ ) which is defined as follows:

$R_s$  = Sensor resistance in displayed gases at various concentrations  
 $R_o$  = Sensor resistance in 1800ppm of iso-butane

**TGS2610-C00 Sensitivity Characteristics:**



**TGS2610-D00 Sensitivity Characteristics:**

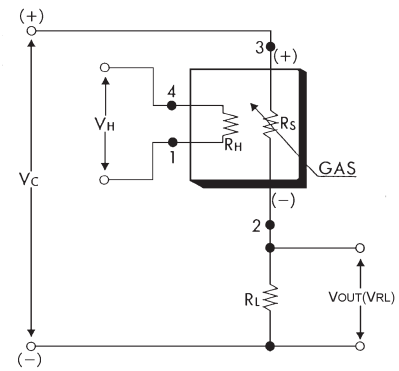


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## Basic Measuring Circuit:

The sensor requires two voltage inputs: heater voltage ( $V_H$ ) and circuit voltage ( $V_C$ ). The heater voltage ( $V_H$ ) is applied to the integrated heater in order to maintain the sensing element at a specific temperature which is optimal for sensing. Circuit voltage ( $V_C$ ) is applied to allow measurement of voltage ( $V_{OUT}$ ) across a load resistor ( $R_L$ ) which is connected in series with the sensor.

A common power supply circuit can be used for both  $V_C$  and  $V_H$  to fulfill the sensor's electrical requirements. The value of the load resistor ( $R_L$ ) should be chosen to optimize the alarm threshold value, keeping power dissipation ( $P_S$ ) of the semiconductor below a limit of 15mW. Power dissipation ( $P_S$ ) will be highest when the value of  $R_S$  is equal to  $R_L$  on exposure to gas.



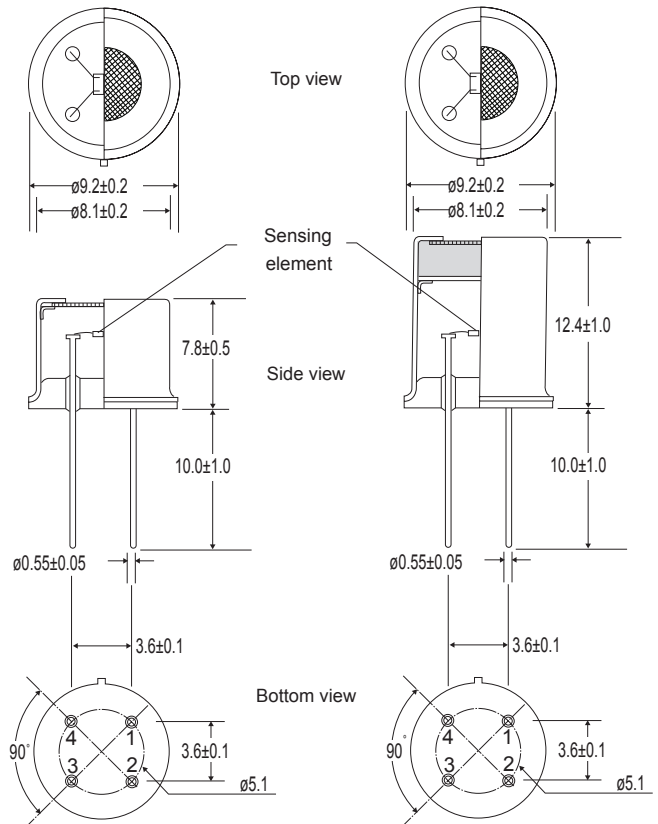
## Specifications:

Model number		TGS2610	
Sensing principle		MOS type	
Standard package		TO-5 metal can	
Target gases		Butane, LP gas	
Typical detection range		500 ~ 10,000ppm	
Standard circuit conditions	Heater voltage	$V_H$	5.0±0.2V AC/DC
	Circuit voltage	$V_C$	5.0±0.2V DC $P_S \leq 15mW$
	Load resistance	$R_L$	variable    0.45kΩ min.
Electrical characteristics under standard test conditions	Heater resistance	$R_H$	approx 59Ω at room temp.
	Heater current	$I_H$	56±5mA
	Heater power consumption	$P_H$	280mW $V_H=5.0V$ DC
	Sensor resistance	$R_S$	0.68~6.8kΩ in 1800ppm iso-butane
	Sensitivity (change ratio of $R_S$ )		0.56±0.06 $\frac{R_S(3000ppm)}{R_S(1000ppm)}$
Standard test conditions	Test gas conditions	Iso-butane in air at 20±2°C, 65±5%RH	
	Circuit conditions	$V_C = 5.0 \pm 0.01V$ DC $V_H = 5.0 \pm 0.05V$ DC	
	Conditioning period before test	7 days	

## Structure and Dimensions:

### TGS2610-C00

### TGS2610-D00



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The value of power dissipation ( $P_S$ ) can be calculated by utilizing the following formula:

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

Sensor resistance ( $R_S$ ) is calculated with a measured value of  $V_{OUT}(V_{RL})$  by using the following formula:

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

### Pin connection:

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

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