FIGARO

PRODUCT INFORMATION

TGS 2610 - for the detection of Combustible Gases

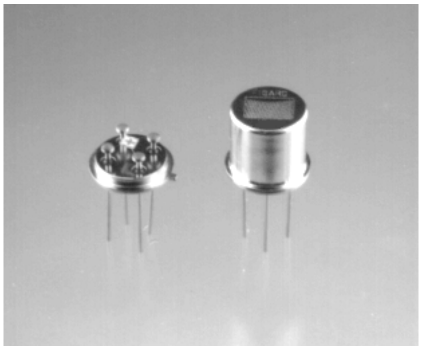
Features:

* General purpose sensor with sensitivity to wide variety of combustible gas
* Low power consumption
* High sensitivity to methane, propane, and butane
* Long life and low cost
* Uses simple electrical circuit

Applications:

* Domestic gas leak detectors and alarms
* Portable gas detectors
* Combustible gas and vapor detection

The sensing element is comprised of a metal oxide semiconductor layer formed on an alumina substrate of a sensing chip together with an integrated heater. In the presence of a detectable gas, the sensor's conductivity increases depending on the gas concentration in the air. A simple electrical circuit can convert the change in conductivity to an output signal which corresponds to the gas concentration.



The **TGS 2610** has high sensitivity to propane, methane, and butane, making it ideal for natural gas and LPG monitoring. The sensor can detect a wide range of gases, making it an excellent, low cost sensor for a variety of applications.

Due to miniaturization of the sensing chip, TGS 2610 requires a heater current of only 56mA and the device is housed in a standard TO-5 package.

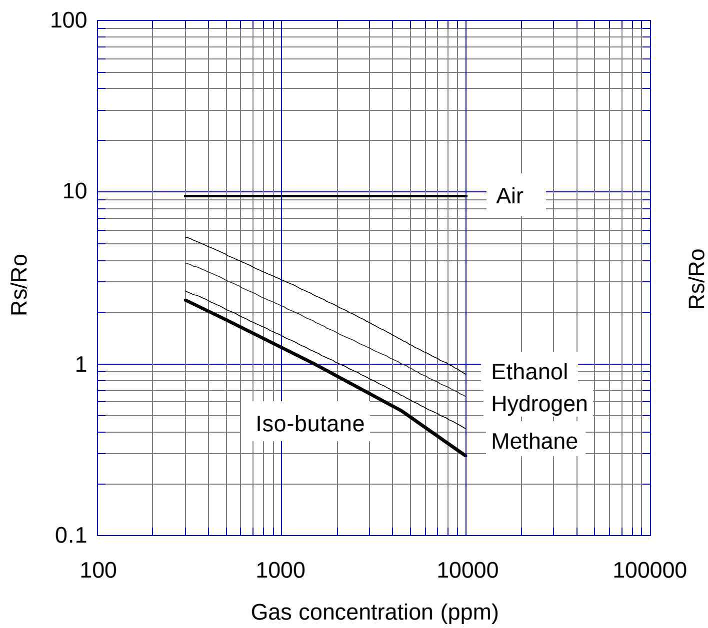
The figure below represents typical sensitivity characteristics, all data having been gathered at standard test conditions (see reverse side of this sheet). The Y-axis is indicated as *sensor resistance ratio* (Rs/Ro) which is defined as follows:

Rs = Sensor resistance in displayed gases at various concentrations
Ro = Sensor resistance in 1500ppm of iso-butane

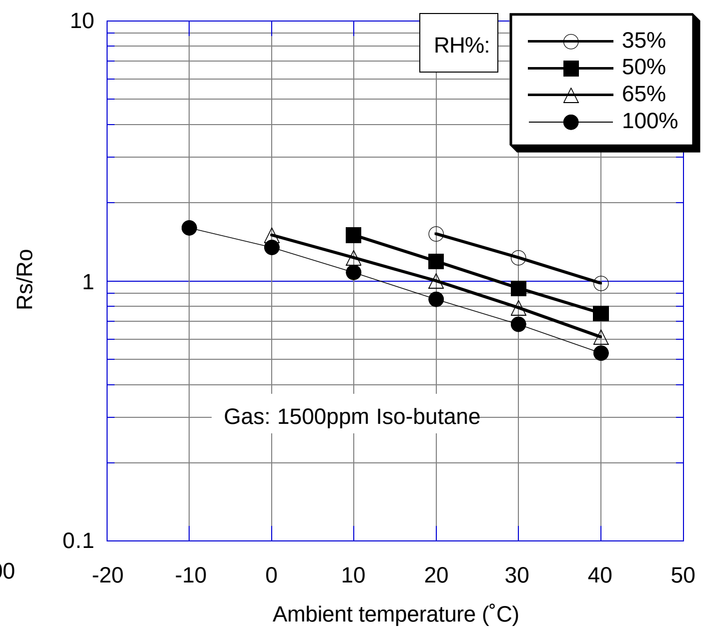
The figure below represents typical temperature and humidity dependency characteristics. Again, the Y-axis is indicated as *sensor resistance ratio* (Rs/Ro), defined as follows:

Rs = Sensor resistance at 1500ppm of iso-butane at various temperatures/humidities
Ro = Sensor resistance at 1500ppm of iso-butane at 20°C and 65% R.H.

Sensitivity Characteristics:



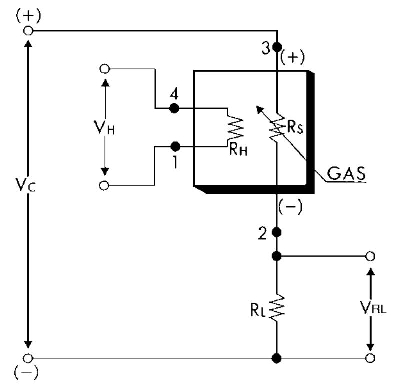
Temperature/Humidity Dependency:



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_{RL}) across a load resistor (R_L) which is connected in series with the sensor.

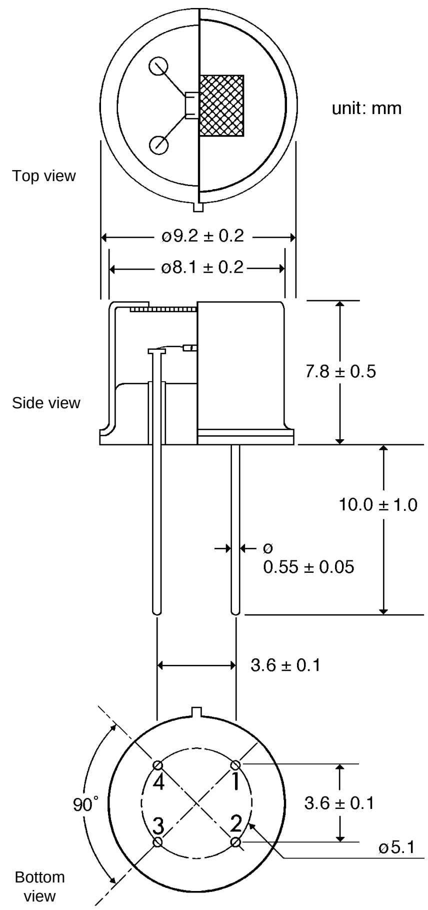
A common power supply circuit can be used for both V_C and V_H to fulfill the sensor's electrical requirements. The value of the load resistor (R_L) should be chosen to optimize the alarm threshold value, keeping power dissipation (P_S) of the semiconductor below a limit of 15mW. Power dissipation (P_S)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



Specifications:

Model number			TGS 2610	
Sensing element type			D1	
Standard package			TO-5 metal can	
Target gases			Combustible gases	
Typical detection range			500 ~ 10,000 ppm	
Standard circuit conditions	Heater Voltage	V_H	5.0±0.2V DC/AC	
	Circuit voltage	V_C	5.0±0.2V DC	Ps ≤ 15mW
	Load resistance	R_L	Variable	Ps ≤ 15mW
Electrical characteristics under standard test conditions	Heater resistance	R_H	57 ± 5Ω at room temp.	
	Heater current	I_H	56mA	
	Heater power consumption	P_H	280mW	VH = 5.0V DC
	Sensor resistance	Rs	1 ~ 5 kΩ in 1500ppm iso-butane	
	Sensitivity (change ratio of Rs)		0.53 ± 0.05	$\frac{Rs\ (4500ppm)}{Rs\ (1500ppm)}$
Standard test conditions	Test gas conditions		Iso-butane vapor in air at 20±2°C, 65±5%RH	
	Circuit conditions		V_C = 5.0±0.01V DC V_H = 5.0±0.05V DC	
	Conditioning period before test		7 days	

Structure and Dimensions:



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

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 (Rs) is calculated with a measured value of V_{RL} by using the following formula:

$$R_S = \frac{V_C - V_{RL}}{V_{RL}} \times R_L$$

FIGARO USA, INC.
3703 West Lake Ave. Suite 203
Glenview, Illinois 60025
Phone: (847)-832-1701
Fax: (847)-832-1705
email: figarousa@figarosensor.com