FIGARO

PRODUCT INFORMATION

TGS 2611 - for the detection of Methane

Features:

* Low power consumption
* High sensitivity to methane
* Long life and low cost
* Uses simple electrical circuit

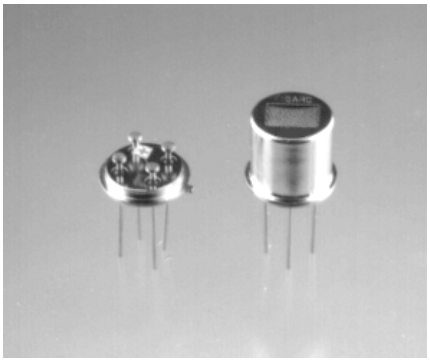
Applications:

* Domestic gas alarms
* Portable gas detectors
* Gas leak detector for gas appliances

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 2611** has high sensitivity and selectivity to methane gas. Due to its low sensitivity to alcohol vapors (a typical interference gas in the domestic environment), the sensor is ideal for domestic gas alarms.

Due to miniaturization of the sensing chip, TGS 2611 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

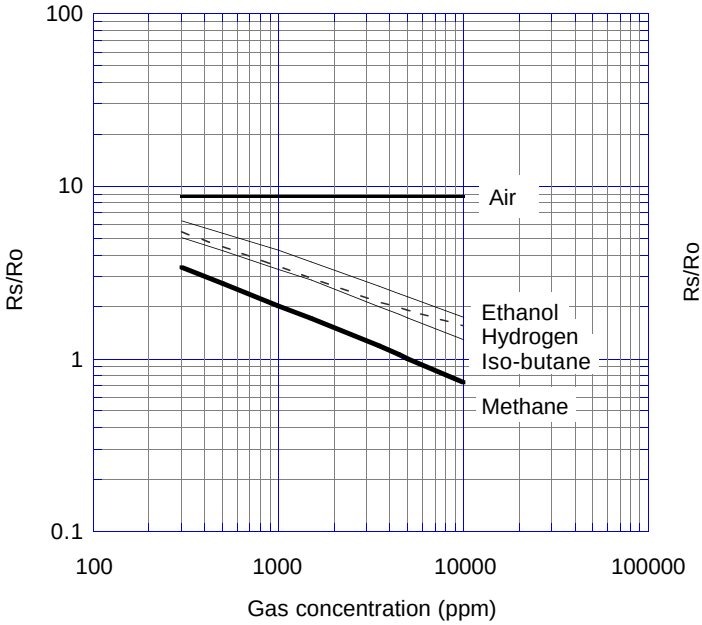
Ro = Sensor resistance in 5000ppm of methane

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:

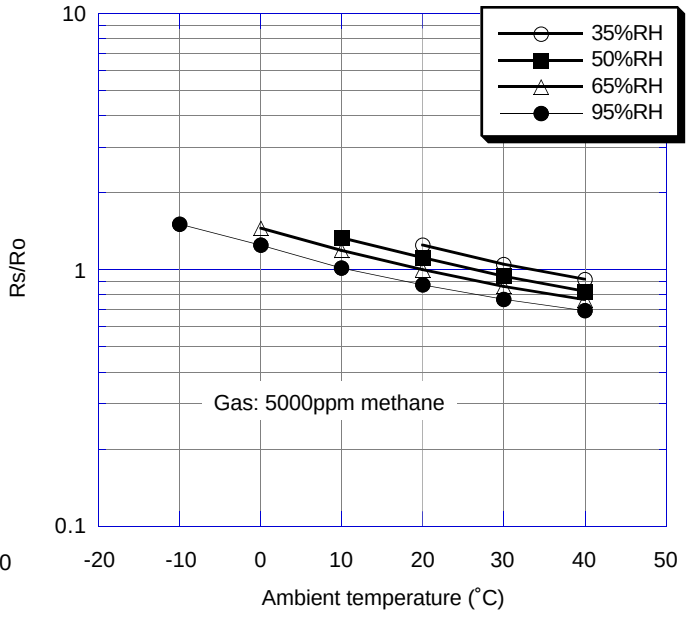
Rs = Sensor resistance in 5000ppm of methane at various temperatures/humidities

Ro = Sensor resistance in 5000ppm of methane at 20°C and 65% R.H.

Sensitivity Characteristics:



Temperature/Humidity Dependency:

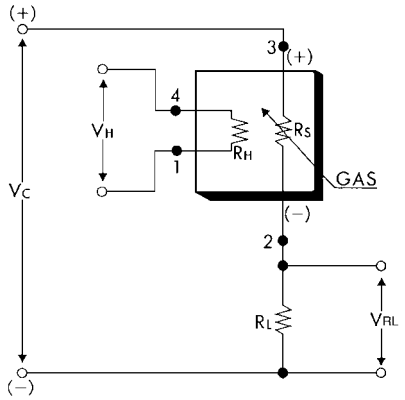


IMPORTANT NOTE: OPERATING CONDITIONS IN WHICH FIGARO SENSORS ARE USED WILL VARY WITH EACH CUSTOMER'S SPECIFIC APPLICATIONS. FIGARO STRONGLY RECOMMENDS CONSULTING OUR TECHNICAL STAFF BEFORE DEPLOYING FIGARO SENSORS IN YOUR APPLICATION AND, IN PARTICULAR, WHEN CUSTOMER'S TARGET GASES ARE NOT LISTED HEREIN. FIGARO CANNOT ASSUME ANY RESPONSIBILITY FOR ANY USE OF ITS SENSORS IN A PRODUCT OR APPLICATION FOR WHICH SENSOR HAS NOT BEEN SPECIFICALLY TESTED BY FIGARO.

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 2611	
Sensing element type			D1	
Standard package			TO-5 metal can	
Target gases			Methane, Natural Gas	
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	59Ω at room temp. (typical)	
	Heater current	I_H	56 ± 5mA	
	Heater power consumption	P_H	280±25mW	
	Sensor resistance	Rs	0.68~6.8 kΩ in 5000ppm methane	
	Sensitivity (change ratio of Rs)		0.60 ± 0.06	Rs (9000ppm) / Rs (3000ppm)
Standard test conditions	Test gas conditions		Methane 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	

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

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

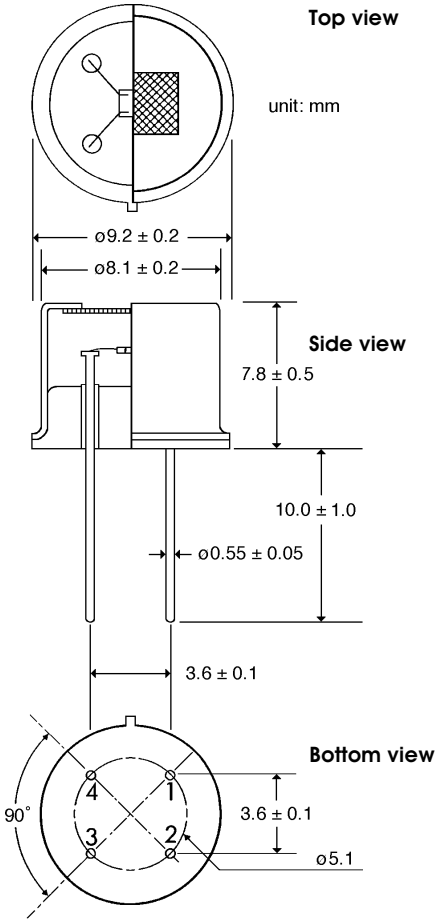
Sensor resistance (Rs) is calculated with a measured value of V_{RL} by using the following formula:

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

For information on warranty, please refer to Standard Terms and Conditions of Sale of Figaro USA Inc.

REV: 9/99

Structure and Dimensions:



Pin connection:

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

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