

TGS2630 Sensor for Detecting Refrigerant Gas

characteristic : _____

- * High sensitivity to non-flammable "A2L" and flammable "A3" refrigerants
- * Selectivity has been greatly improved
- * Simple application circuit
- * low power consumption

The sensor element consists of an integrated heater and tin oxide (SnO₂) semiconductor on an alumina substrate. When the detected gas is present in the air, its concentration increases proportionally with the sensor's conductivity. A simple circuitry converts these conductivity changes into corresponding signal outputs that directly reflect the gas concentration levels.

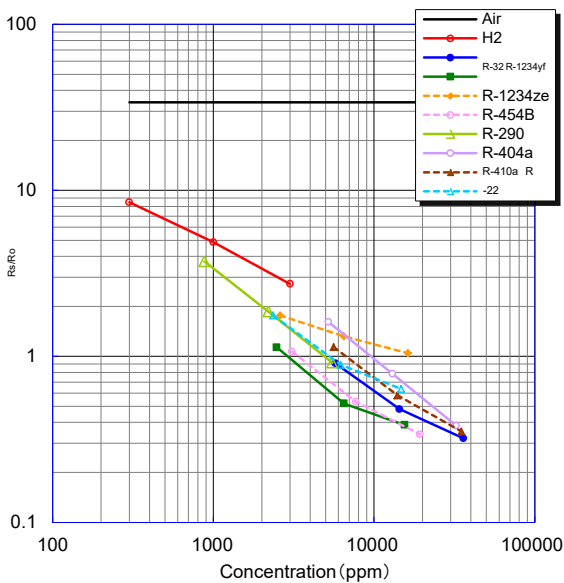
The TGS2630 sensor demonstrates exceptional performance across multiple applications. It is widely used for detecting refrigerants in HVAC systems, including the most commonly employed R-404a and R-410a, while maintaining high sensitivity for "non-flammable (A2L)" refrigerants like R-32 and R-1234yf, as well as "flammable (A3)" refrigerants such as R-290 (primarily composed of propane) that reduce the Global Warming Potential (GWP). Featuring an integrated filter layer, it shows minimal sensitivity to volatile alcohol compounds – a common environmental interference – highlighting its high selectivity for "A2L" refrigerants. With its compact design, the TGS 2630 requires only 56mA heating current and is housed in a standard TO-5 metal package.

Sensitivity characteristics: _____

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

The vertical coordinate represents 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 gas concentrations
- R_o = Resistance of the sensor at 5000ppm R-32



apply : _____

* For refrigerant leakage detection in air conditioning and refrigeration systems

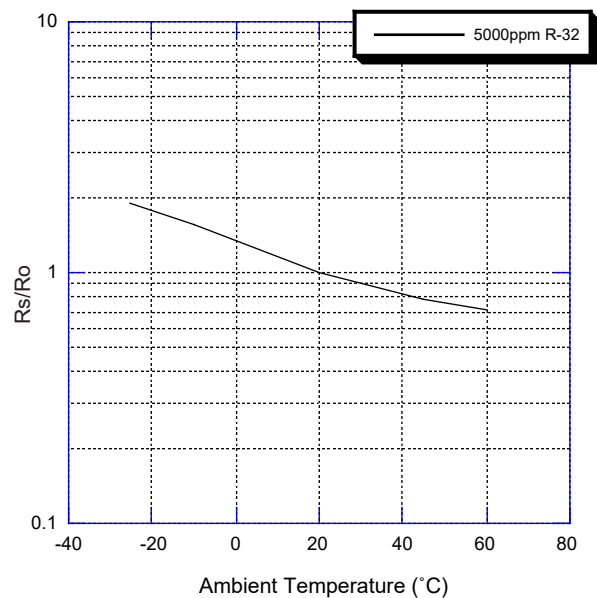


Temperature and humidity characteristics: _____

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

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

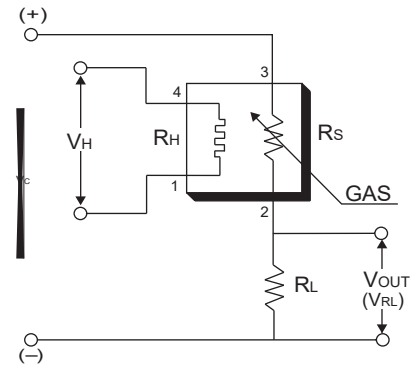
- R_s = Sensor resistance at 5000ppm R-32, 40% R.H humidity
- R_o = Resistance of the sensor at 5000ppm R-32, temperature and humidity of 20°C / 40% R.H.



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 assumes no liability for any usage that has not undergone professional testing by Feigaro.

Basic test circuit:

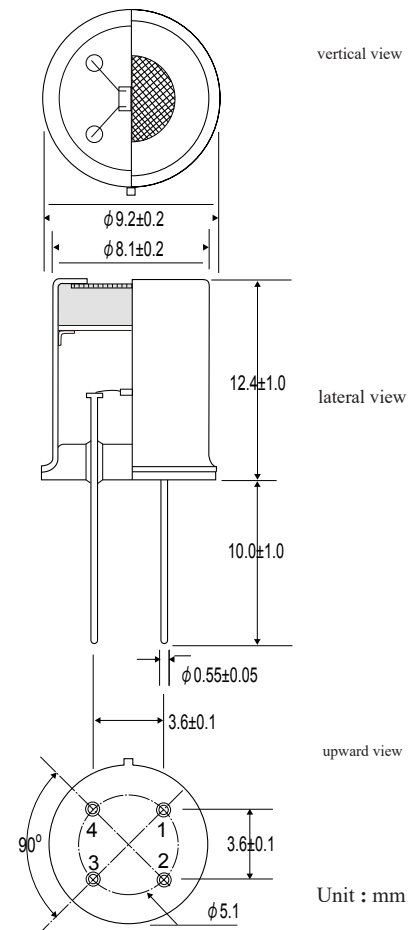
This sensor requires heater voltage (V_H) and loop voltage (V_C). V_H is applied to the integrated heater to maintain a temperature suitable for the sensing element in contact with the target gas. V_C measures the loop output voltage ($V_{OUT}[V_{RL}]$) across the load resistor (R_L) connected in series with the sensor. The sensor has polarity requirements, so DC power supply is essential for the circuit. Provided that the electrical characteristics of the sensor are satisfied, V_C and V_H can share a common power circuit. When selecting the load resistor, choose the value that provides optimal response within the target gas concentration range. Additionally, ensure the maximum power consumption (P_S) of the sensor elements remains below 15mW at the limit load resistance value (R_L). Power consumption reaches its peak when the resistance of R_L exposed to gas equals that of R_S .



specifications :

model		TGS2630	
Detection principle		Oxidized semiconductor type	
Standard encapsulation		TO-5 Metals	
Object gas		Refrigerant gas	
Scope of detection		1000 ~ 10000ppm	
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 (typical)
	Heater current	I_H	$56 \pm 5mA$
	Heater power consumption	P_H	$280mW$ $V_H=5.0V$ DC
	Sensor resistor	R_S	$0.46 \sim 10k\Omega$ 5000 ppm R-32 in
	Sensitivity (rate of change of R_S)		$0.2 \sim 0.7$ (R-32) R_S (9000ppm) R_S (3000ppm)
standard test conditions	Test gas conditions	R-32 in air 20 ± 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 connection :

- 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:

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

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

REV. 01 / 20 This information and product specifications may be modified by Figaro without prior notice in order to improve or enhance the performance of the products.

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