TGS826 Gas Sensor for Ammonia Detection

characteristic：

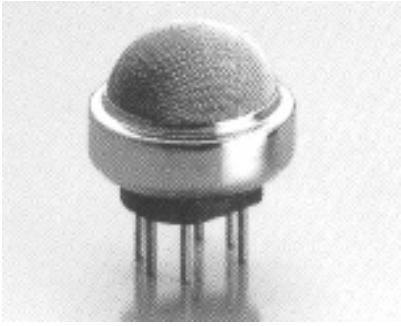
* Highly sensitive to ammonia
* Can respond quickly to low concentrations of ammonia
* Simple application circuit
* Ceramic base can withstand extreme conditions

apply：

* Used to detect refrigerant leaks
* Ventilation control for agriculture and aquaculture

The Faguo sensor's sensitive element is constructed from tin dioxide (SnO_2) semiconductor. In clean air, it exhibits low conductivity. When the detection gas is present in the air, the gas concentration increases proportionally with the sensor's conductivity. Through a simple circuit design, these conductivity changes can be converted into corresponding signal outputs that indicate the gas concentration.

TGS826 has a high sensitivity to ammonia, which can detect the concentration of ammonia in the air as low as 30ppm. It is an ideal refrigerant critical safety detection sensor and can also be used for ammonia leakage detection in agriculture.

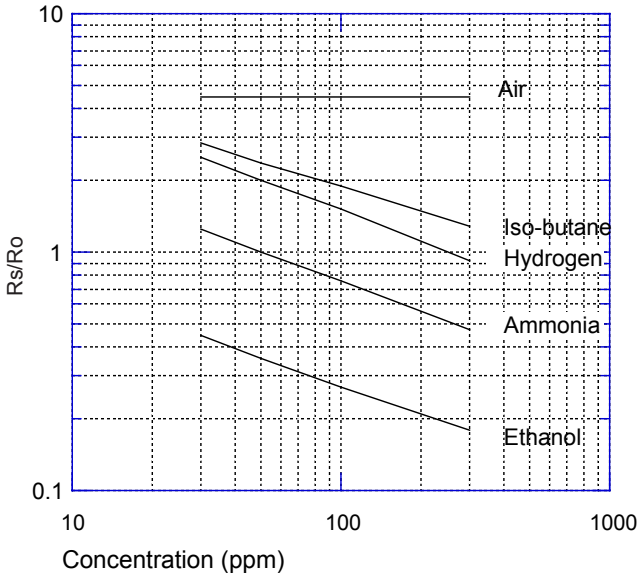


Sensitivity characteristics:

The following figure shows the typical sensitivity characteristic curve, which was measured under our company's standard test conditions (see back).

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

Rs = Sensor resistance value in various gas concentrations Ro = 50ppm ammonia sensor resistance value



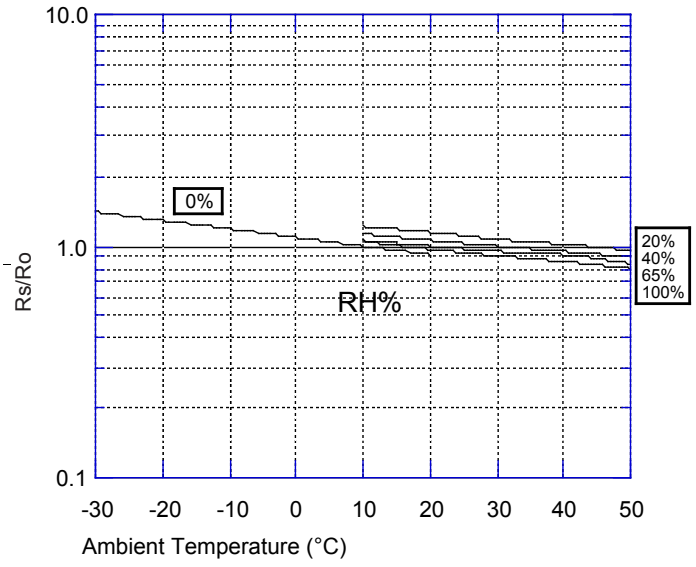
Temperature and humidity characteristics:

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

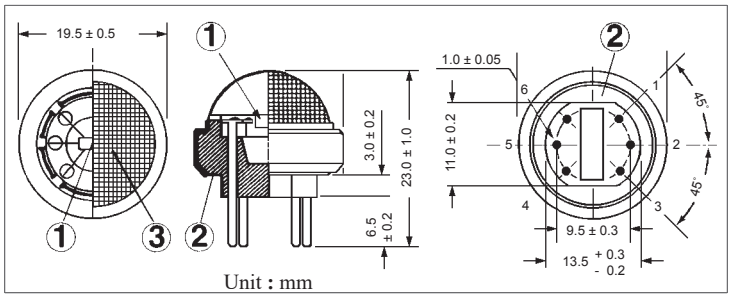
The vertical axis shows the sensor resistance ratio Rs / Ro, where Rs and Ro are defined as follows:

Rs = Resistance value of the sensor at various temperature and humidity in 50ppm ammonia gas

Ro = Resistance value of the sensor in 50ppm ammonia gas, temperature and humidity of 20°C, 65% R.H



Structure and size:



Unit：mm

① Detection element:

An oxidation aluminum ceramic tube with a built-in heating wire and a sintered surface

A thick layer of SnO_2 coating

② Sensor substrate:

alumina ceramics

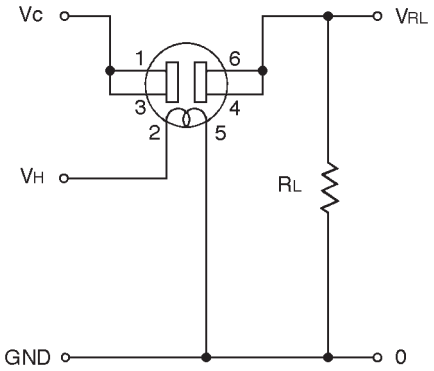
③ back-fire relief valve：

SUS 316 100 mesh double layer wire mesh

Pin and basic test circuit:

The circuit diagram on the right shows the sensor's symbol code, and the structure above and the size diagram show the sensor's pin numbers.

Since the sensor is polarized, the loop voltage must be DC (shown by the white dot at pin 2). As shown in the figure, when the sensor is connected to the base circuit, the rise of the load output voltage (V_{RL}) and the fall of the sensor resistance (R_S) will depend on the detected concentration of the target gas.



Standard circuit conditions:

model			TGS826	
Object gas			ammonia	
Scope of detection			30 ~ 300ppm	
Standard loop conditions	heater voltage	VH	5.0±0.2V AC/DC	
	loop voltage	Vc	Maximum 24 V (only DC)	Ps≤15mW
	load resistance	RL	variable	Ps≤15mW
Under standard test conditions Electrical properties	Heating element resistance	RH	At room temperature 30± 3Ω	
	Heater current	IH	167mA	
	Heater power consumption	PH	833mW	VH=5.0V DC
	Sensor resistor	RS	20 ~ 100kΩ in 50 ppm ammonia	
	Sensitivity (rate of change of Rs)		0.55±0.15	Rs (150ppm) / Rs (50ppm)
standard test conditions	Test gas conditions		Ammonia gas in air 20 ±2. C,65±5%R.H.	
	Loop conditions		Vc = 5.0±0.01V DC VH = 5.0±0.05V DC RL = 33kΩ±1%	
	preheating time		7 sky	

The power consumption value (P s) can be calculated by the following formula:

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

The sensor resistance (R s) can be calculated from the following formula according to the measured value of V_{OUT} (V_{RL}):

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

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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