

Description

The SGAS706 is a solid-state chemiresistor sensor designed to detect nitrogen oxides in air. The sensor uses an integrated heater with highly sensitive MO_x material tailored for detection of nitrogen oxides.

SGAS706 Sensor



Features

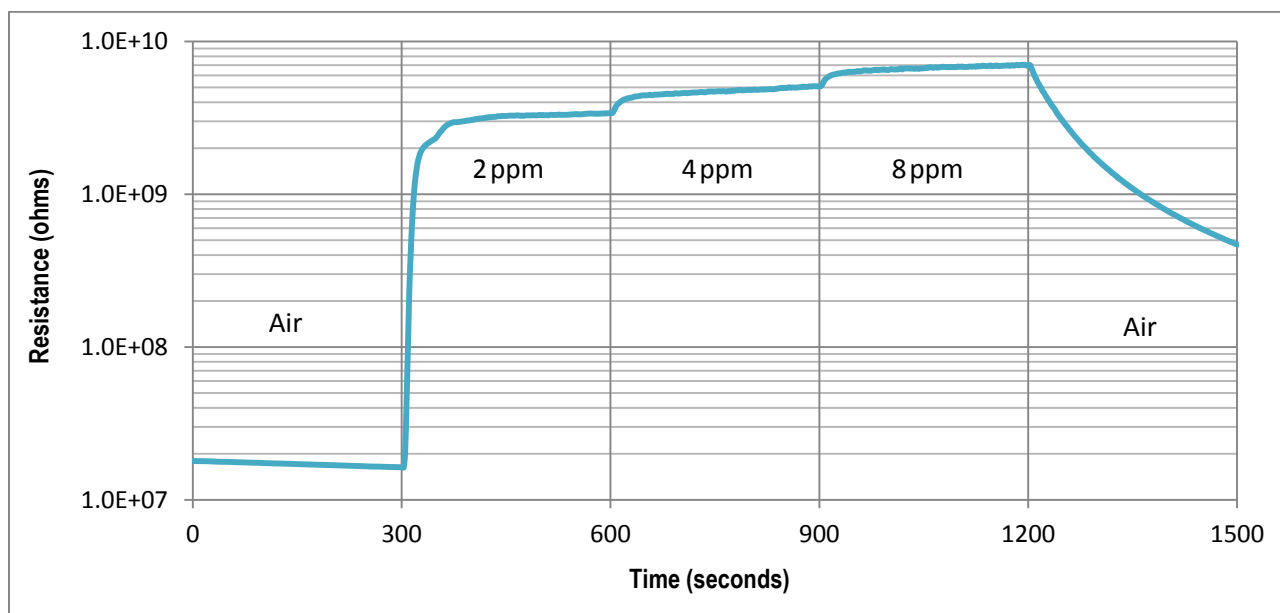
- Sensor detects very low NO_x concentrations (<0.5 to 10 ppm)
- Larger dynamic range available (5 to 100 ppm with modified heater input)
- Environmental temperature range of -20°C to 50°C
- Environmental humidity range of 0% to 90% RH, noncondensing
- Low dependence on flow rate

Applications

- Outdoor Air Quality
- Breath Detection

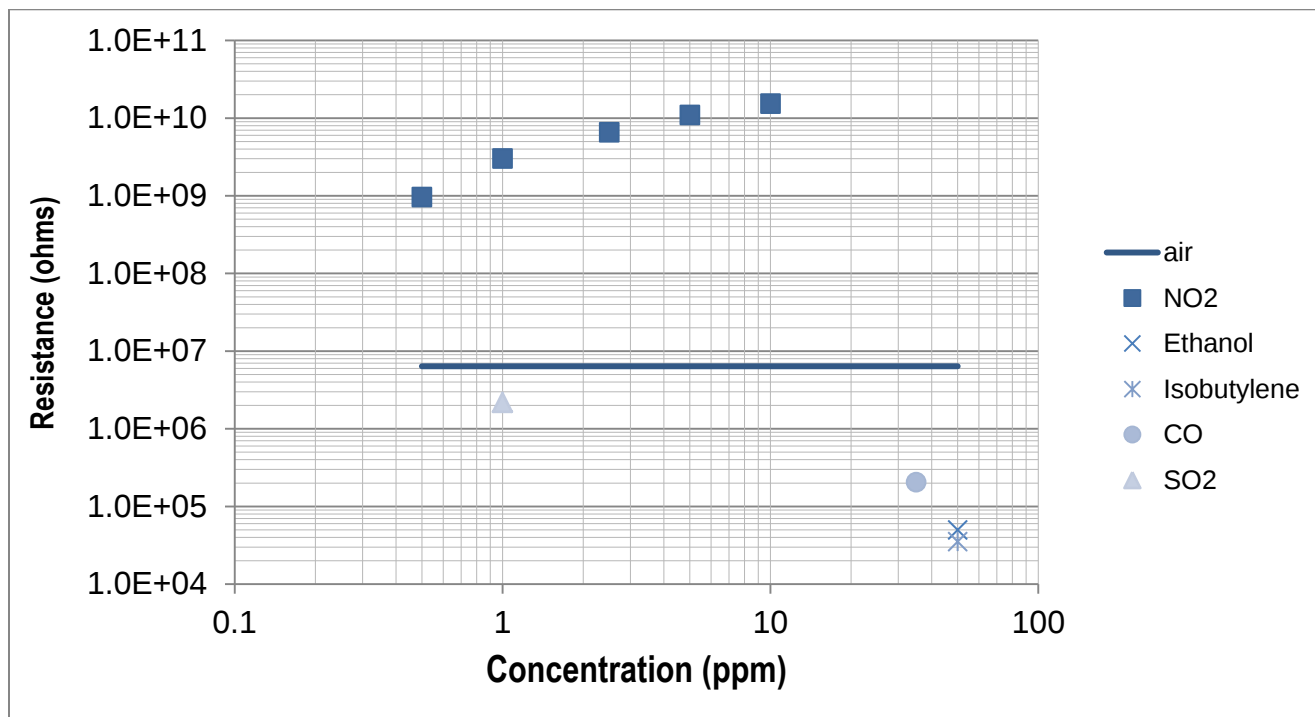
Sensor Response Characteristics

Figure 1. Typical Response Data for Sensors Operated in Clean, Dry Gas



The NO_x sensor responds to most potential interferent vapors in the opposite direction from the NO_x response. This includes carbon monoxide and VOCs. The sensor exhibits a small response to ozone in the same direction as NO_x. The response to 0.1ppm ozone is less than the response to 0.1ppm NO₂.

Figure 2. Sensitivity and Selectivity



Typical NO_x Sensor Selectivity

Table 1. Typical NO_x Sensor Selectivity

Challenge Gas	Concentration	R_g/R_a or $-R_a/R_g$
NO ₂	10ppm	200
NO _x	10ppm	45
H ₂	100ppm	-2.2
NH ₃	25ppm	-1.1
CO ₂	5%	No response
SO ₂	5ppm	No response
CH ₄	1%	No response

Pin Assignments

Figure 3. Pin Assignments for SGAS706 Header – Top View

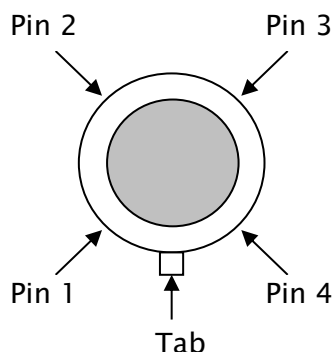


Table 2. Pin Descriptions

Pin Number	Name	Description
1	Heater +	Positive input for V_H heater voltage supply
2	Sensor +	High-side of resistive sensor element; positive input for sensing voltage V_C
3	Heater –	Negative (ground) input for V_H heater voltage supply
4	Sensor –	Low-side of resistive sensor element; connects to middle of resistor divider circuit and produces sensing voltage output (V_{OUT})

Electrical Characteristics

Note: The specifications in Table 1 are typical values for NO_x sensors. If the actual values differ, the customer will be notified with the shipment.

Note: All measurements were made in dry gas at room temperature. Specifications are subject to change.

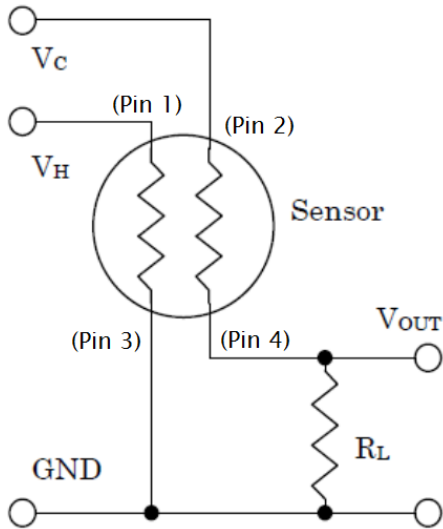
Table 3. DC Electrical Characteristics

Symbol	Parameter	Conditions	Minimum	Typical	Maximum	Units
P_H	Heater power consumption	$V_H = 4.7$		500		mW
V_H	Recommended heater voltage	$T_{\text{sensor}} = 200^\circ\text{C}$		4.7		VDC
R_H	Heater resistance	At room temperature	28	30	32	Ω
V_C	Recommended sensing voltage	Recommended	2.5		5.0	VDC
R_a	Resistance in air		0.020		20	M Ω
R_{10}	Resistance in 10ppm NO ₂		0.002		10	G Ω
R_{10}/R_a	Sensitivity		100			

Basic Measurement Circuit

The sensor can be operated using a simple voltage divider. This requires two voltage supplies: heater voltage (V_H) and circuit voltage (V_C). V_H is applied to the heater in order to maintain a constant, elevated temperature for optimum sensing. V_C is applied to allow a measurement of the output voltage (V_{OUT}) across a load resistor (R_L).

Figure 4. Basic Measurement Circuit



Pins 1 and 3 are attached to the heater. Apply V_H across these pins.

Pins 2 and 4 are attached to the resistive sensor element. Connect these pins in the measuring circuit. IDT supplies basic measurement circuitry for many of our sensors. Contact your local sales representative for more information.

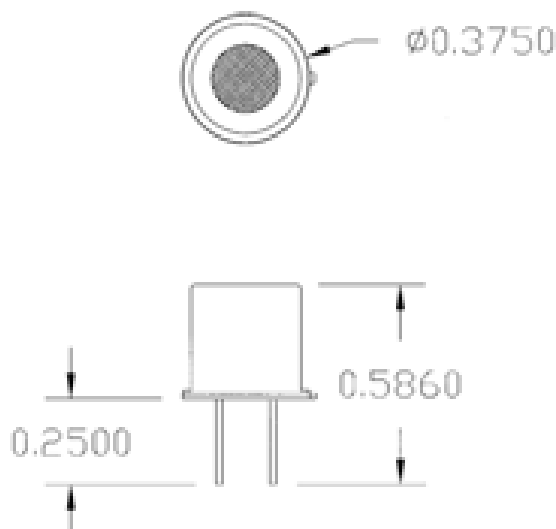
Sensor Resistance Calculation

Sensor resistance (R_S) is calculated using the following formula (see Figure 4):

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

Package Drawing

Figure 5. Package Outline Drawing and Dimensions



Ordering Information

Orderable Part Number	Package	Shipping Packaging	Temperature
SGAS706	TO-39	Box	-20°C to +50°C

Revision History

Revision Date	Description of Change
November 9, 2016	Initial release with IDT branding.



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