VOC Sensor

p-type Metal Oxide

Technical Specification

This sensor is a broadband total VOC detector. When the cost of a PID is not justifiable, this sensor will detect VOCs with 10-50 ppb limit of detection, depending on the VOC.

Unlike common n-type sensors, this metal oxide sensor has a large dynamic range, repeatable response, low humidity response and resistance increases in the presence of most VOCs.

The change in resistance can be converted to an output voltage via a simple electrical circuit. Although the sensor can be used in constant temperature/ voltage mode, best response is achieved when the sensor is cycled between 400°C (sensing temperature) and 525°C (reset temperature). See our Application Note.

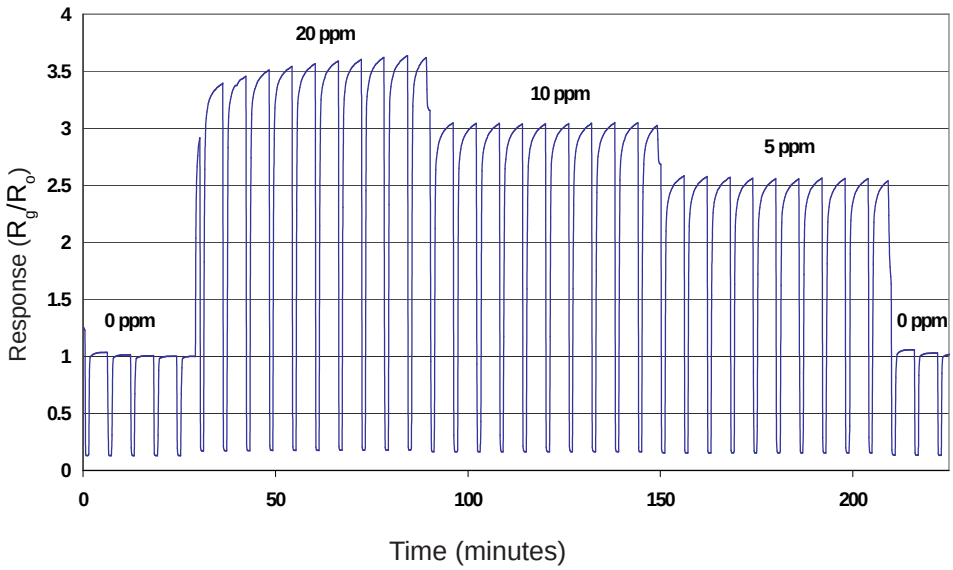
PERFORMANCE

Range	ppm isobutylene limit of performance warranty	1 to 100
Sensor resistance (R_o)	kΩ (50% rh, 23 ± 2°C)	220 ±45
Sensor resistance ratio (R_g/R_o x 100%)	%; Isobutylene @ 10ppm in air	285 ±30
Gas response relationship (R_g/R_o - 1 = Σk_i x Conc^n)		0.5 +/- 10% (k for isobutylene)
where k_i = constant for gas i, n = 1 or 0.5		0.5 (n for isobutylene)
Heater resistance (R_H @ RT)	Ω (23 ±1°C)	10 ±1.5
Heater resistance (R_H @ sensing temp.)	Ω (400 ±10°C)	22 ±3
Heater resistance (R_H @ reset temp.)	Ω (525 ±10°C)	26 ±3
Heater power consumption (mW) typical for 5:1	V_H = 2.7 ±0.2V (400°C)	340 ±30
	3.7 ±0.3V (525°C)	530 ±50
Operating Temperature Range	°C	-20 to 120

SENSITIVITY TO OTHER GASES

EtOH response	% measured gas @ 10 ppm EtOH	TBA
C_3H_8 response	% measured gas @ 500 ppm C_3H_8	TBA

Figure 1 Response from 0 to 20ppm Isobutylene



Real time response at 20,10 and 5 ppm Isobutylene in 50% rh. Sensor operating in 2-temperature mode, pulsing between 400°C for 5 mins and 525°C for 1 min.

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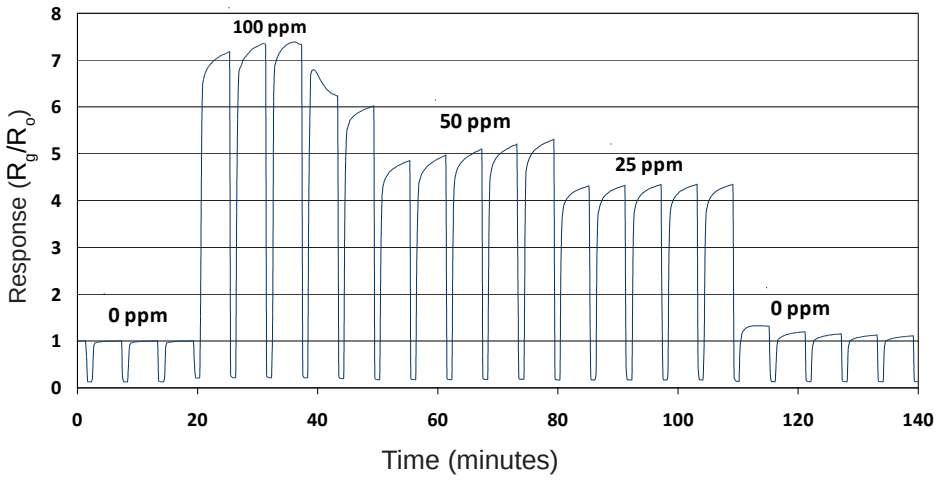
Performance Data

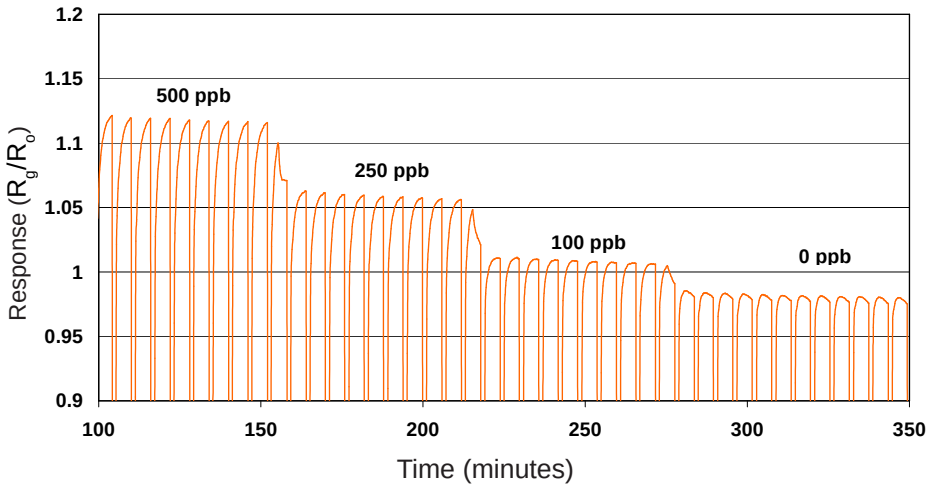
Technical Specification

Figure 2 Response from 0 to 100ppm Ethanol



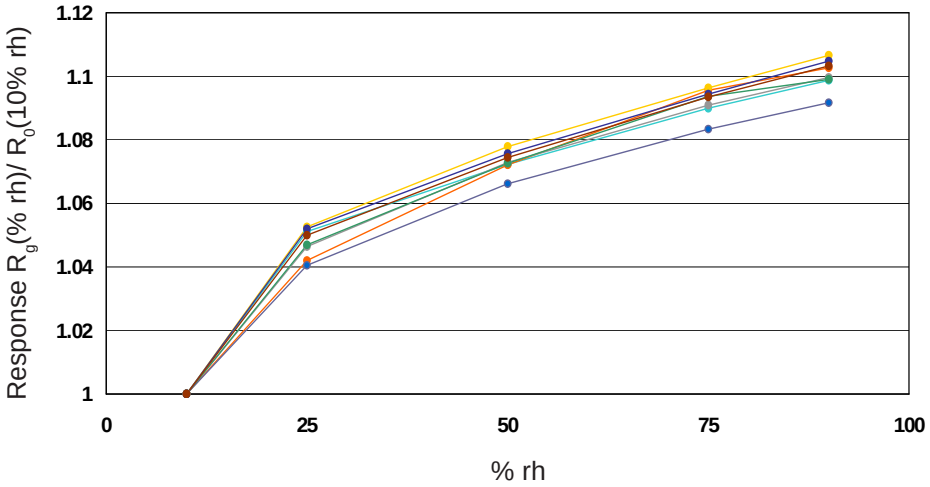
Real time response to 100, 50 and 25 ppm Ethanol in 50% rh.
Sensor operating in 2-temperature mode, pulsing between 400°C for 5 mins and 525°C for 1 min.

Figure 3 Response from 0 to 500ppb Benzene



Real time response to 500, 250 and 100ppb Benzene in 50% rh. Sensor operating in 2-temperature mode, pulsing between 400°C for 5 mins and 525°C for 1 min.

Figure 4 Response from 10% to 90% rh at 23°C



Response over a range of 10% - 90% rh air, operating in 2-temperature mode with a 5:1 cycle ratio of sensing (400°C) and resetting (525°C)

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