

Multi-Pixel Gas Sensors

Experts in Environmental Sensing

SGP – Metal-Oxide Gas Sensors for Indoor Air Quality Applications

- Outstanding long-term stability based on Sensirion's MOXSens® Technology
- Calibrated indoor air quality signals
- Ultra-low power consumption
- Very small DFN package and I²C interface

SENSIRION
THE SENSOR COMPANY

Multi-Pixel Gas Sensors for Measuring Indoor Air Quality

The SGP gas sensors offer a complete sensor system integrated into a very small $2.45 \times 2.45 \times 0.9 \text{ mm}^3$ DFN package featuring an I²C interface and fully calibrated air quality output signals. Sensirion's MOXSens[®] Technology enables highly sensitive and reliable measurements of typical indoor pollutants like volatile organic compounds or hydrogen. The SGP further combines multiple metal-oxide sensing elements on one chip to provide more detailed air quality signals.

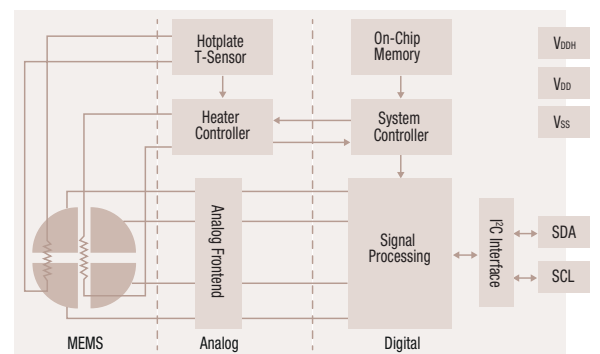
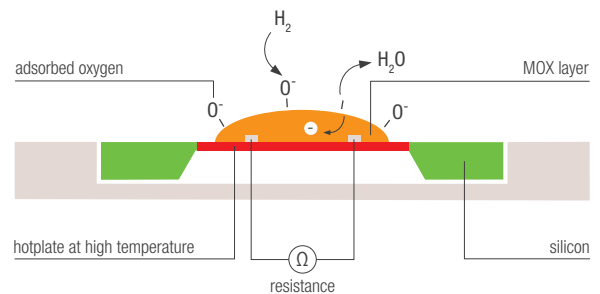
Unique Performance Thanks to MOXSens[®] Technology

MEASUREMENT PRINCIPLE

The sensing principle of the SGP is based on a heated film of metal-oxide (MOx) nanoparticles. Adsorbed oxygen on the metal-oxide particles reacts with the target gas and thereby releases electrons. This results in a change of the electrical resistance of the metal-oxide layer that is measured by the sensor.

The SGP multi-pixel gas sensor platform integrates four sensing elements – the pixels – into one small DFN package. Using Sensirion's CMOSens[®] Technology, the SGP offers a complete sensor system on a single chip featuring a digital I²C interface, a temperature-controlled micro-hotplate, as well as preprocessed and calibrated indoor air quality signals.

Optimized metal-oxide sensing materials in combination with Sensirion's multi-pixel gas measurement platform result in a unique resistance against contamination by siloxanes – MOXSens[®] Technology. Sensirion's MOXSens[®] Technology enables highly sensitive and reliable gas measurements of indoor air pollutants such as volatile organic compounds and hydrogen.



LONG-TERM STABILITY OF METAL-OXIDE GAS SENSORS

Traditional metal-oxide gas sensors suffer from poor long-term stability caused through irreversible contamination by siloxanes.

Siloxanes are everywhere

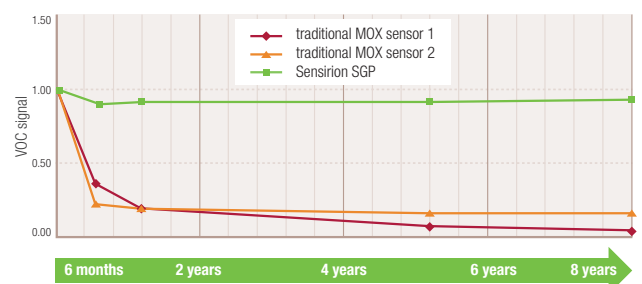
- Indoor environments
- "Most abundant VOC emitted by humans"
- Consumer products

Siloxanes destroy metal-oxide sensors

- Significant loss of VOC sensitivity
- Strong increase of response time

Solution

Sensirion's proprietary MOXSens[®] Technology provides the SGP with an unmatched robustness against siloxanes, resulting in unique long-term stability and accuracy.



What We Offer

Expert first contact

Fast and easy product evaluation

Design-in support

Lifetime support

1. EXPERT FIRST CONTACT

- Specialized and experienced sales force
- Worldwide presence with a global distribution network

2. FAST AND EASY PRODUCT EVALUATION

- Easy-to-use evaluation kits for effortless gas measurements during sensor evaluation
- Technical documents – datasheets, application notes, drivers

3. DESIGN-IN SUPPORT

- Assistance in the integration of SGP sensors into your application
- Years of experience in the design-in of environmental sensors

4. LIFETIME SUPPORT

- Reliable and flexible production
- Sustainable product innovation roadmap to meet your future needs

Sensirion Evaluation Kit for Environmental Sensors

FAST AND EASY EVALUATION FOR YOUR SENSOR APPLICATION

The evaluation kit SEK-Environmental Sensing is designed for a quick, easy and cost-efficient evaluation of Sensirion's environmental sensors. This facilitates to evaluate sensors and develop innovative sensor applications.

The kit combines plug-and-play hardware with an easy-to-use viewer software for in-depth evaluation, the ControlCenter. Each evaluation kit includes a Sensirion SensorBridge, all required connector cables, as well as various sensor samples. The SensorBridge features two independent I²C channels that allow simultaneous evaluation of two environmental sensor samples. The ControlCenter viewer software makes it possible to display and log the sensor signals for multiple sensors connected to several SensorBridges on the same PC.



Multi-Pixel Gas Sensors



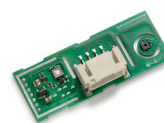
SGP30

- Multi-pixel air quality sensor
- TVOC and CO₂eq outputs
- Humidity compensation



SGPC3

- Ultra-low power air quality sensor
- TVOC output
- Humidity compensation



SVM30

- Air quality and RH/T sensor module
- TVOC, CO₂eq, RH and T outputs
- 5 V supply voltage

	SGP30	SGPC3	SVM30
Output	<ul style="list-style-type: none"> Total VOC in ppb H₂-based CO₂eq in ppm 	<ul style="list-style-type: none"> Total VOC in ppb 	<ul style="list-style-type: none"> Total VOC in ppb H₂-based CO₂eq in ppm Relative humidity Temperature
Supply voltage	1.62–1.98V		4.5–5.5 V
Average current	48 mA	Low power mode: 1 mA Ultra-low power mode: 0.065 mA	49 mA
Package	6-pin DFN 2.45 x 2.45 x 0.9 mm ³		PCB 39 x 15 x 6.5 mm ³
Interface	I ² C 1.8 V		I ² C 5 V
Indoor Air Quality			
Typ accuracy	15% of measured value		
Output range¹	TVOC: 0–60'000 ppb CO ₂ eq: 0–60'000 ppm	TVOC: 0–60'000 ppb	TVOC: 0–60'000 ppb CO ₂ eq: 0–60'000 ppm
Sampling rate	1 s	Low power mode: 2 s Ultra-low power mode: 30 s	1 s
Long-term stability	MOXSens [®] siloxane resistance: Typ 1.3% accuracy drift per year in siloxane accelerated lifetime test		
Baseline compensation	On-chip baseline compensation algorithm		
Humidity compensation	Yes ²		
Temperature			
Measurement range	–	–	–20 °C – 85 °C
Typ accuracy	–	–	± 1 °C
Humidity			
Measurement range	–	–	0% – 100% RH
Typ accuracy	–	–	± 5% RH

Please note that the above values are of indicative nature only. For detailed information please consult the respective datasheet.

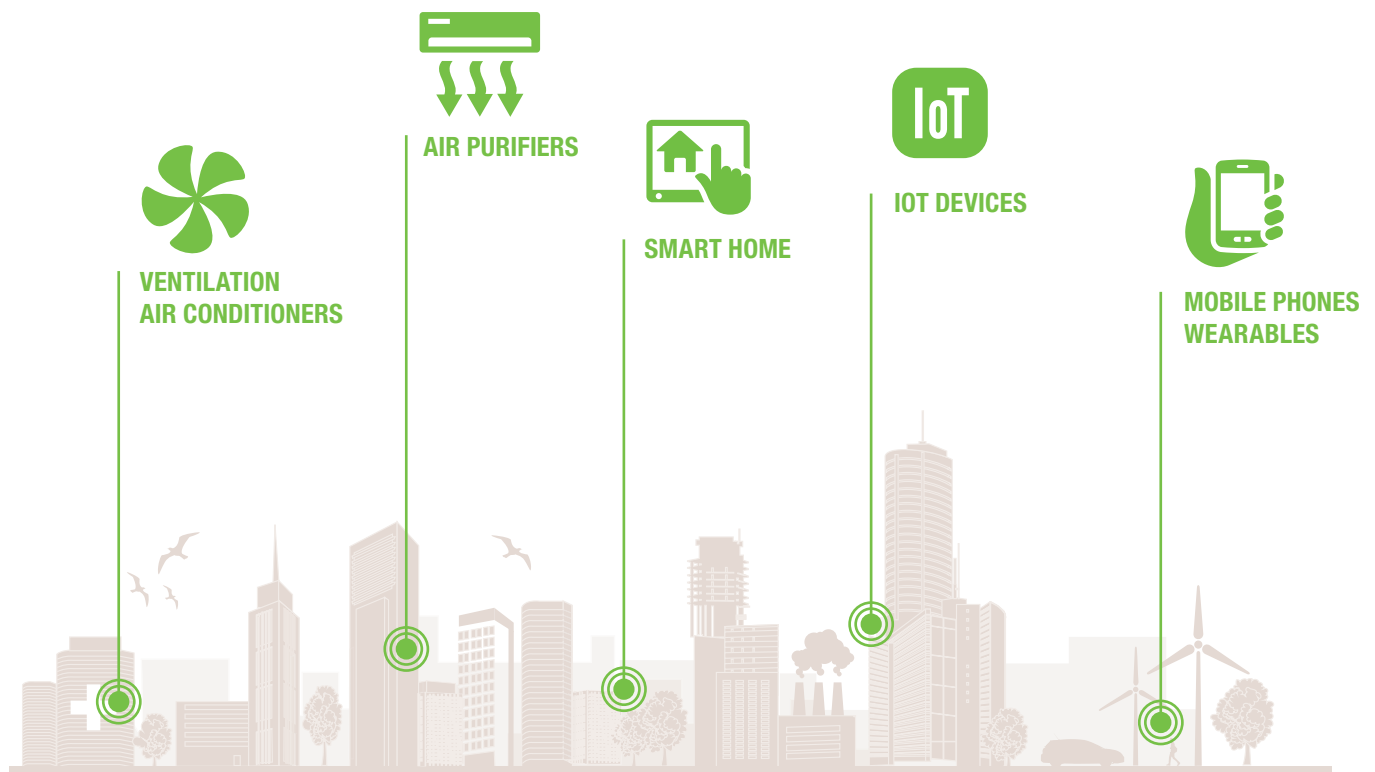
¹ CO₂eq output is based on a hydrogen measurement. The SGP is not suited for applications where detection of real CO₂ is required.

² To use the humidity compensation feature of the SGP an additional humidity sensor like the SHTxx is required.

Applications

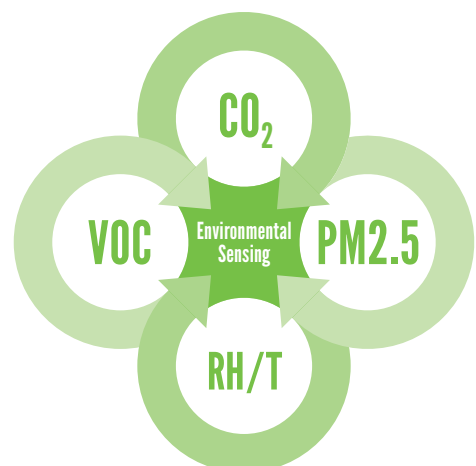
The SGP multi-pixel gas sensors are suitable for various applications and designed for

- making devices smarter
- increasing energy efficiency
- improving comfort and well-being of customers



Environmental Sensing

Environmental conditions have a major impact on our well-being, comfort, and productivity. Sensirion's environmental sensor solutions provide detailed and reliable data on key environmental parameters such as humidity, temperature, volatile organic compounds (VOCs), particulate matter (PM2.5), and CO₂. Environmental sensing opens up new possibilities to create smarter devices that improve our comfort and well-being as well as increase energy efficiency in a wide variety of applications.



Sensing. Anytime. Anywhere.

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