# Gas Sensor Platform SGP4x

Experts in environmental sensing

SENSIRION

SGP4x Multi-Pixel Gas Sensors

The SGP4x gas sensor platform for VOC and/or NO_x measurements is designed as a digital smart switch and regulation unit for air treatment devices such as air purifiers. The sensor's raw signals are processed by Sensirion's Gas Index Algorithm, and can be used directly to automatically trigger the removal of indoor air gas pollutants by air treatment devices without the need for user-device interaction. This sensor solution is thus well-suited for constant monitoring of VOC and NO_x levels, including potentially harmful events which are imperceptible to humans. Furthermore, automatic control of air treatment devices based on the SGP4x's signals helps to save energy by turning them off once the VOC and/or NO_x events have been taken care of.
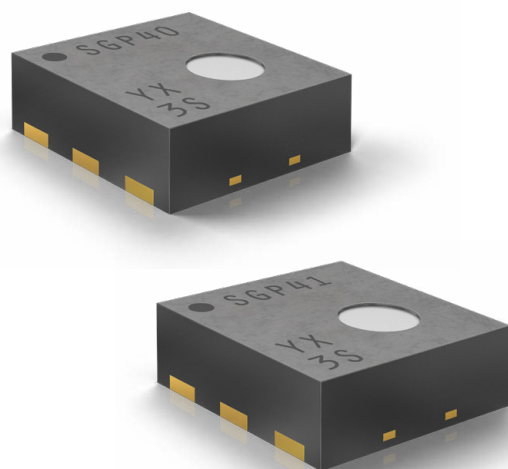
SGP4x sensors are metal oxide-based and integrate CMOSens® sensor systems onto a single chip. They offer a solution for one (SGP40) or two (SGP41) complete sensors, facilitating design-in and cutting design costs. Thanks to its very small DFN packaging (2.44 × 2.44 × 0.85 mm³), the sensor can be incorporated into applications with limited space.

The SGP4x's multi-pixel sensing element features unmatched robustness against contaminating gases that are present in real-world applications, enabling its exceptional long-term stability and low drift. Sensirion's state-of-the-art production process guarantees high reproducibility and reliability. Tape and reel packaging, together with its suitability for standard SMD assembly processes, make the SGP4x appropriate for high volume applications.

Signal output	SGP40	SGP41
VOC	yes	yes
NO_x	no	yes

Applications

- Air purifiers
- Kitchen hoods
- Demand-controlled ventilation
- Air exchange units
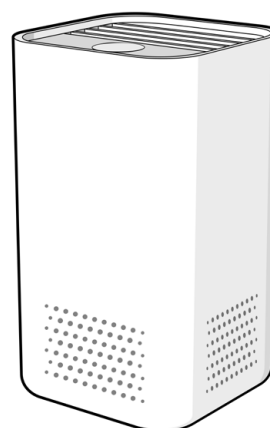
Technology and benefits

Technology	Benefits
Excellent longevity of >10 years thanks to siloxane-resistance (MOXSens® Technology)	Reliable sensor hardware
Gas Index Algorithm	No signal processing programming by customer required
On-chip humidity compensation	Optimal performance in various environments
Low heat emission	Enhanced precision of RH&T readings, less backgrounds
Two sensors on a single chip (SGP41)	Cost reduction and easier design-in

Specifications

| Gas Sensing Specifications	VOC	NO_x
Applicable product	SGP40, SGP41	SGP41
Algorithm output	1–500 VOC Index points [1]	1–500 NO_x Index points [1]
Sensor raw output	16-bit ticks [2]	16-bit ticks [2]
Measurement range	0–1,000,000 ppb of ethanol equivalents	0–10,000 ppb of NO_2
Device-to-device variation	< ± 15 VOC Index points or % m.v. (whichever is larger)	< ± 50 NO_x Index points or % m.v. (whichever is larger)
Limit of detection	<50 ppb of ethanol equivalents or <10 % of concentration setpoint (whichever is larger)	<20 ppb of NO_2 or <10 % of concentration setpoint (whichever is larger)
Response time (tau 63%)	<10 s	<250 s
Switch-on time	<60 s	<60 s
Electrical Specifications		
Supply voltage range	1.7–3.6 V	1.7–3.6 V
Idle current	34 µA	34 µA
Current consumption during operation at 1.8 V	3.5 mA	4.3 mA
at 3.3 V	2.6 mA	3.0 mA
Interface	I²C	I²C

[1] Sensirion's Gas Index Algorithm processes the raw signals externally into read-to-use air quality signals.
[2] The raw signal is proportional to the logarithm of MOX resistance.

SEK-SVM4x Evaluation Kit

The SEK-SVM4x evaluation kit has been designed for easy and cost-efficient evaluation of Sensirion's SGP40 VOC and SGP41 VOC+NO_x sensor. The kit contains the SVM41 sensor module and is equipped with an SGP41, an SHT40 humidity sensor and a microcontroller featuring VOC and NO_x Index, relative humidity and temperature outputs via either an I²C or UART interface.

In addition to the SVM41, the SEK-SVM4x comes with a UART-USB cable that allows for evaluation of the sensors, e.g., by Sensirion's easy-to-use SEK-ControlCenter viewer software as well as a 6-pin jumper wire cable that enables fast prototyping, e.g., through integration into existing platforms (like Arduino, RaspberryPi, etc.). The software and relevant documentation can be downloaded from our website.
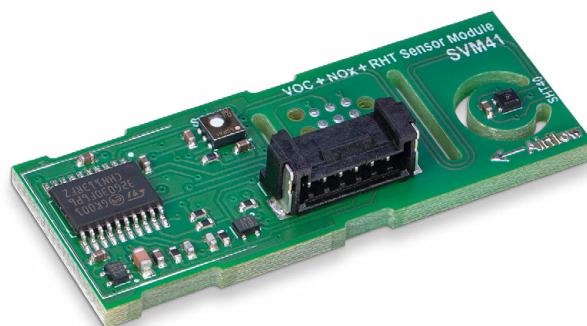
Learn more: www.sensirion.com/my-sgp-ek

Environmental sensing

Environmental conditions have a major impact on our well-being, comfort, and productivity. Sensirion's sensor solutions provide detailed and reliable data on key environmental parameters such as humidity, temperature, volatile organic compounds (VOCs), particulate matter (PM2.5), formaldehyde, NO_x and CO_2. 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. We accompany you through the entire product development process, from the initial idea to product launch and beyond. Our expertise ranges from prototype construction, design-in support and use-case development to inline testing at the mass production stage.