

## Ultra-low power multi-gas sensor for monitoring indoor air quality

### Technology Advantage

Our Micro-hotplate technology provides a unique silicon platform for our Metal Oxide (MOX) gas sensors and enables sensor miniaturisation, significantly lower power consumption and fast heating times.

The Micro-hotplates are fabricated using a robust silicon dioxide membrane and includes an embedded tungsten heater acting as a heating element for the MOX based sensing material. The micro-hotplate can be used to heat the MOX material to up to 400°C and its electrical resistance can be monitored to detect the target gas. Through enabling fast heater cycling times, temperature modulation techniques can be used to reduce the device power consumption and implement advanced gas sensing methods.

Advanced algorithms enable support for; gas discrimination, temperature & humidity drift compensation, and self-calibration.

### Product Overview

CCS801 is an ultra-low power MOX multi-gas sensor for monitoring indoor air quality including Carbon Monoxide (CO) and a wide range of Volatile Organic Compounds (VOCs). CCS801 can be used as a CO<sub>2</sub> equivalent sensor to represent CO<sub>2</sub> levels in real world environments, where the main cause of VOCs is from humans.

The sensitivity of CCS801 to a target gas is optimised by adapting the supply voltage ( $V_H$ ) of the integrated micro-heater, and the gas concentration can be correlated to the change in resistance of the MOX sensing layer ( $R_S$ ).

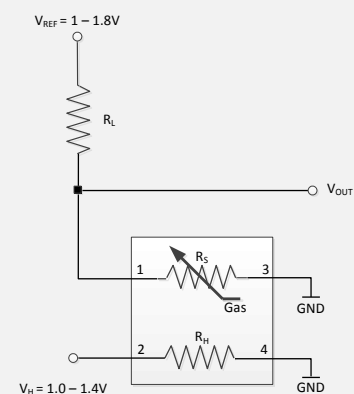
$V_H$  can be set using a low-dropout (LDO) regulator or operated in pulsed PWM mode to reduce power consumption. The sensor resistance ( $R_S$ ) is determined using a series load resistor ( $R_L$ ), a reference voltage ( $V_{REF}$ ), and an output voltage ( $V_{OUT}$ ) read by an Analogue-to-Digital Converter (ADC).

### Miniaturisation

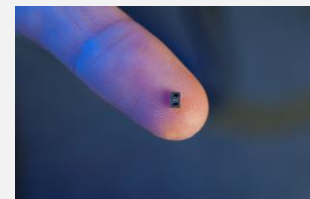
The CCS801 multi-gas sensor is supported in a compact 2 mm x 3 mm DFN (Dual Flat No lead) package as standard. Other package options may be available on request. The inherent design of this sensor enables ultra-low power consumption for battery operated portable handheld devices.

### Key Benefits

- Ultra-low power consumption for battery operated devices
- High sensitivity and fast heating times
- Compact 2mm x 3mm DFN package for small form factor designs



### Recommended Sensor Configuration



### Applications

- Total VOC sensor for Indoor air quality monitoring
- Alcohol breathalyser
- Toxic gas (CO) detection

