

mySENS® – more than gas sensing

mySENS® – CCFET gas sensing technology

The Micronas CCFET sensor (CCFET = Capacitive-Coupled Field-Effect Transistor) represents a new versatile integrated sensor technology. This sensor technology aims at detection of concentration changes of selected gases in ambient environments in a broad variety of different applications.

The fabrication process is embedded into Micronas' CMOS manufacturing technology. Thus, the sensor is integrated with control and evaluation electronics into one single chip, profiting from both miniaturization, as well as design experience of advanced semiconductor technology.

The sensor is based on a conventional MOSFET (Metal-Oxide-Semiconductor Field-Effect Transistor) with its floating gate connected to a large sensing electrode. The electrode is capacitively coupled to a gas-sensitive layer on a suspended gate that is mounted on top of the chip, with an air gap in between. Any gas induced change of the sensitive layer's surface potential induces a modulation of the readout transistor, that is detected by the integrated electronics.

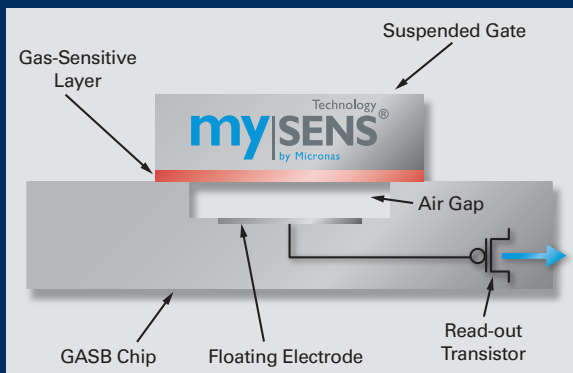
Micronas has developed a patented sensor set-up for drift reduction and temperature compensation. The latest sensor chip generation includes two individual CCFET modules, a temperature sensor, a relative humidity sensor, and electronic components, such as voltage and power regulators, A/D and D/A devices and a digital control interface.

The CCFET sensor solution provides significant advantages in system size and power consumption.

For prototype evaluation, the sensor is mounted in a standard small form factor package, sealed against dust by a diffusion membrane. Different package options are possible.

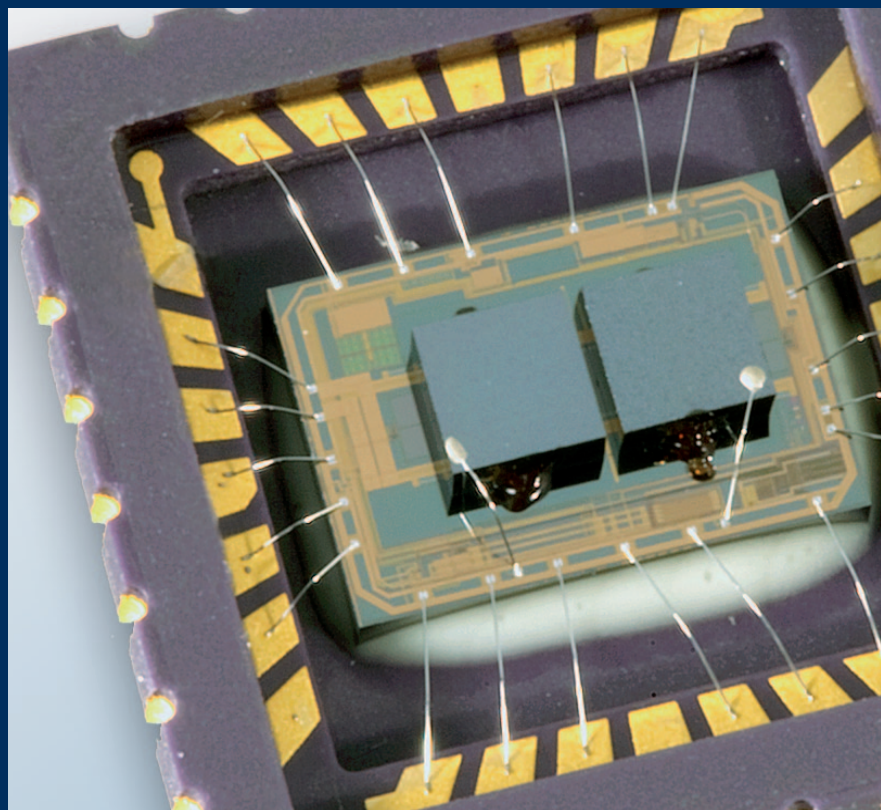
Contact us and find out about the benefits of mySENS®.

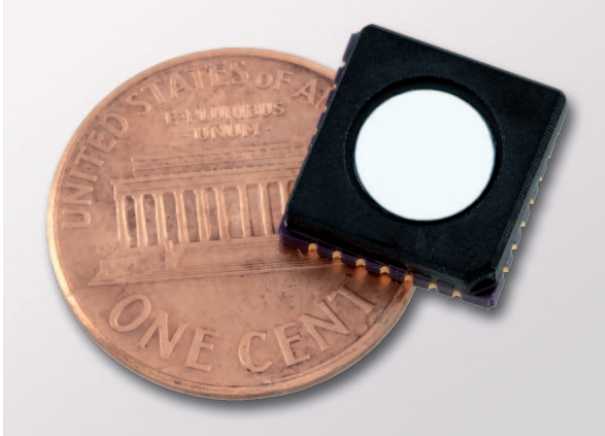
mySENS@micronas.com



The interaction between sensitive layer and ambient gas molecules is a dynamic process that reacts directly to gas concentration changes. As these processes already take place at room temperature, an unheated low-power operation is possible for certain gas species.

The CCFET sensor platform can be individually tailored to a specific sensing task by choosing the appropriate sensitive layer for the suspended gate. A variety of different materials is available, including noble metals, metal oxides or organic layers, depending on the application.

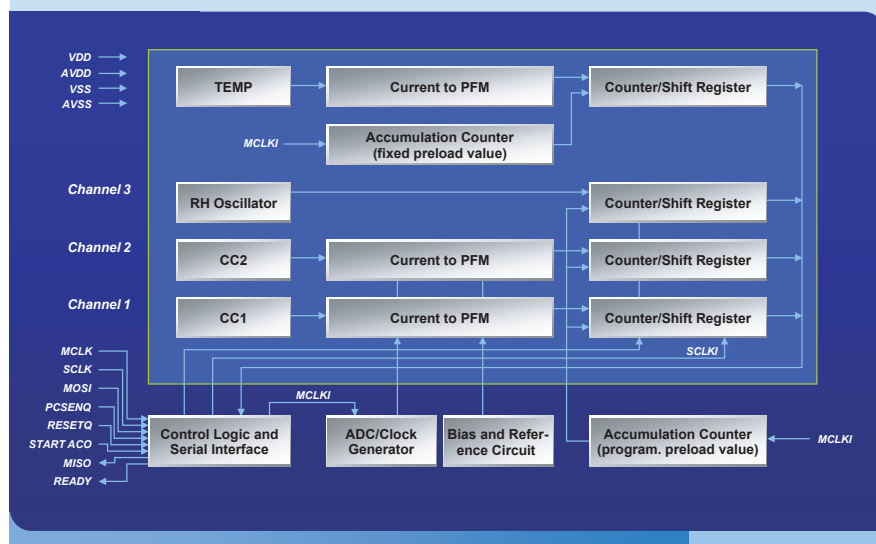




Micronas' GAS 85xyB sensor chip

With the GAS 85xyB sensor chip, Micronas introduces a patented set-up for drift reduction and temperature compensation. This IC contains two CCFET gas sensing channels (CC1, CC2), a temperature and a humidity sensor (RH). Each sensor channel has its own ADC which can digitally be read by the use of an SPI interface. The SPI interface is also used to configure and control this IC.

GAS 85xyB Block Diagram



GAS 85xyB sensor chip application areas

Building technology

- Comfort and energy efficiency in building automation (HVAC, air quality, DCV)
- Life safety by CO control and early fire detection

Medical technology

- Breath analysis

Automotive

- Air quality / window defogging
- CO₂ leakage (coolant)
- H₂ leakage (fuel cell vehicles)
- Driver alcohol control

Consumer

- Air quality, e.g. O₃, NO_x
- Portable fire detector / air analyzer

Industrial and environmental analytics

- Process monitoring and control, storage applications
- Work place security, e.g. CO₂, NH₃ ...



Company Profile

Micronas (SIX Swiss Exchange: MASN), a semiconductor designer and manufacturer with worldwide operations, is a leading supplier of cutting-edge IC and sensor system solutions for automotive electronics. Micronas offers a variety of microcontrollers and Hall sensors for automotive and industrial applications, such as car dashboard, body control, as well as motor management and comfort functions.

Micronas serves all major automotive electronics customers worldwide, many of them in continuous partnerships seeking joint success. While the holding company is headquartered in Zurich (Switzerland), operational headquarters are based in Freiburg (Germany). For more information on Micronas and its products, please visit www.micronas.com.

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