

MOX Gas Sensor Interface

Operation of various MOX sensors

Key Parameters

- Supply voltage typ. 3.3 V
- Heater voltage 1 V ... 20 V
- Heater current 5.4 mA ... 43.2 mA
- System clock 8 MHz
- Ambient temperature -40°C ... 85°C
- Heater current resolution 10 bit (icd, vdc)
16 bit (isd)
- Measurement resolution 16 bit (@ 1.9 kHz)
- Resistance measurement 10 nA ... 10 μ A (rci)
0 V ... 1 V (rcv)

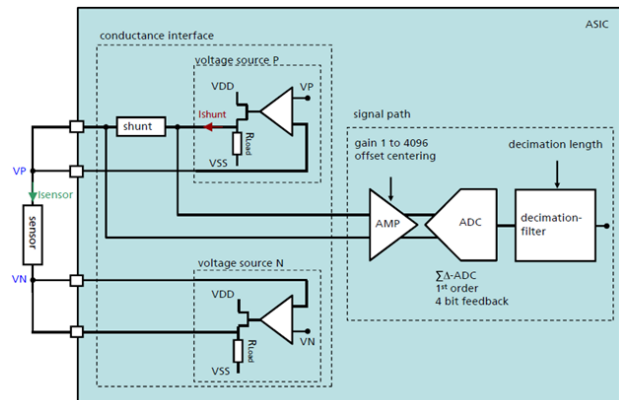


Fig. 1: Block Diagram

General Description

The MOX sensor interface is designed to increase the performance of MOX gas sensors. With the MOX interface it is possible to control the heater temperature with a high accuracy and read out the sensor resistance over a wide measurement range. The MOX interface consists of two fast analogue channels to measure the heater temperature and the sensor resistance in parallel. This enables fast temperature cycled operations which can increase the sensitivity and selectivity of the MOX sensor.

The communication with MOX interface is done with a register based SPI interface.

Heater control

The MOX interface has five integrated heater bias modes which can power the heater up to 800mW. If higher power is needed the MOX interface can control an external transistor. In this case the maximum heater power is defined by the transistor.

Heater bias modes: constant current (icd), constant voltage (vdc), sigma delta modulated current (isd), pulse width modulated current (ipwm), pulse width modulated voltage (vpwm), control of an external transistor for high heater power (iext)

Resistance measurement

The sensors resistance can be measured over a wide range from 100 Ω to 1G Ω via two different interfaces. Additionally it is possible to commutate the readout bias and thus reduce the aging of the sensor.

Resistance measurement modes: constant current readout (rci), constant voltage readout (rcv)

Benefits

- Easy to use MOX sensor control and readout
- Wide range of suitable MOX sensors
- Accurate temperature control
- Temperature cycled operation

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