

Description

The ZMOD4410 Gas Sensor Module is designed for detecting total volatile organic compounds (TVOC) and monitoring indoor air quality (IAQ) in different use cases. It is a 12-pin LGA assembly ($3.0 \times 3.0 \times 0.7$ mm) that consists of a gas sense element and a CMOS signal conditioning IC. The module's sense element consists of heater element on a Si-based MEMS structure and a metal oxide (MOx) chemiresistor. The signal conditioner controls the sensor temperature and measures the MOx conductivity, which is a function of the gas concentration.

The measurement results can be read via an I2C interface with the user's microprocessor, which processes the data to determine the TVOC concentration, IAQ rating, and estimated carbon dioxide (eCO₂) level. Alternatively, depending on the operation mode, the ZMOD4410 software can generate a control signal, which can trigger actions based on odor levels. With its low operating current consumption in Low-Power Operation Mode, the ZMOD4410 is an excellent choice for low-voltage and low-power battery applications. Built-in nonvolatile memory (NVM) stores the configuration and provides space for arbitrary user data.

Typical Applications

- Indoor air monitoring
- Monitor home, office, and personal environments for healthy conditions and comfort
- Detect hazardous materials and unhealthy conditions (e.g., fumes from construction materials)
- Automation based on indoor ambient air quality (HVAC, air purifiers, thermostats, etc.)

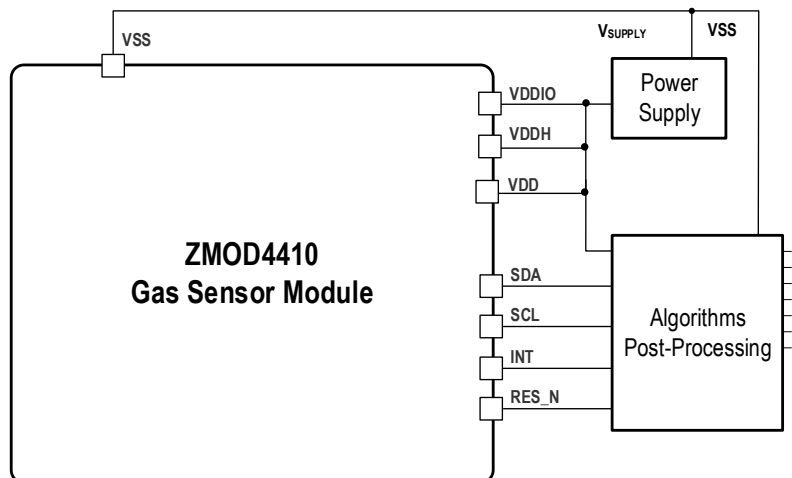
Available Support

- ZMOD4410 Evaluation Kit
- Manuals, application notes, blog, and white papers
- Instructional videos
- Programming libraries, example codes, and algorithm support to optimize performance
- Third-party certification for compliance with well-accepted international IAQ standards

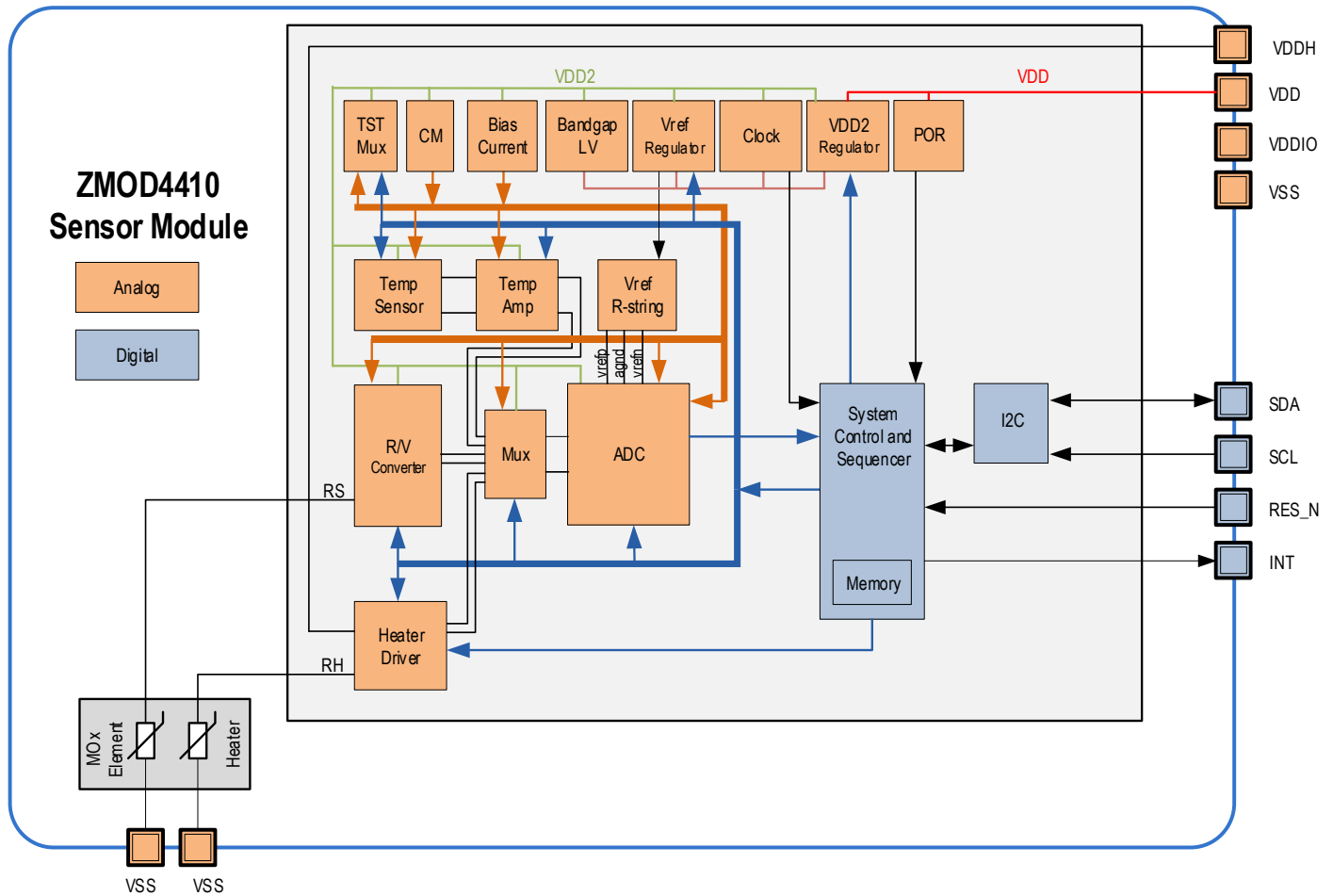
Features

- Measurement of total organic compounds (TVOC) concentrations and indoor air quality (IAQ)
- Module algorithm estimates carbon dioxide level (eCO₂)
- Algorithm to set a control signal to trigger an external action based on IAQ and odor change
- Heater driver and regulation loop for constant heater voltage or constant heater resistance
- Internal auto-compensated temperature sensor; not stress sensitive
- I2C interface: up to 400kHz
- Configurable alarm/interrupt output with static and adaptive levels
- Adjustable ADC resolution for optimal speed versus resolution: 16-bit maximum
- Built-in nonvolatile memory (NVM) for user data
- Very low average power consumption down to 1mW
- Excellent for low-voltage and low-power battery applications
- No external trimming components required
- External reset pin (active-LOW)
- Customization for mobile and consumer applications
- Siloxane resistant
- Supply voltage: 1.7V to 3.6V
- Package: 12-LGA
- Assembly size: $3.0 \times 3.0 \times 0.7$ mm

ZMOD4410 Application Circuit



Block Diagram



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