

ZMOD4410 GAS SENSOR FOR INDOOR AIR QUALITY



Renesas' ZMOD4410 gas sensor platform provides best-in-class stability and sensitivity and is designed to detect trace gases in various locations within indoor environments. The ZMOD4410 gas sensor features embedded artificial intelligence (e-AI), enabling smart odor sensing for ventilation systems, bathroom monitoring and controls, and air quality monitors. The ZMOD4410 gas sensor module can be configured for use in individual rooms in homes and buildings, such as bathroom and kitchens, to solve unique air quality problems. The sensor is supplied with pre-compiled libraries that run on microcontroller platforms, such as Renesas' RL78 MCU.

Key features

- Sensor output based on AI machine learning algorithmic 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
 - Algorithm to discriminate sulfur-based odors
- Firmware for mobile, industrial, and consumer applications

Benefits

- Proven MOx material with 15+ years of reliability data
- Contamination and siloxane resistant
- Each sensor module is electrically and chemically tested and calibrated
- Renesas offers downloadable source files and compiled code, enabling a product road map of indoor air measurement innovation

Applications

- Monitor school, office, home, and personal environments for health conditions and comfort
- Smart appliances that control or monitor indoor air quality
- Automation based on indoor ambient air quality (HVAC, air purifiers, thermostats, hoods, etc.)

ZMOD4410 GAS SENSOR PRODUCT DETAILS

Physical characteristics

- Power consumption <1.5 mW in low power operation
- -40°C to +65°C operating temperature range
- 1.7 to 3.6 V supply voltage
- 3.0 x 3.0 x 0.7 mm 12-LGA package

Product support

- Evaluation kits
- Manuals, videos, application notes, white papers, and programming examples
- Third-party certification for compliance with standard defined by the German Environment Agency (UBA) and best available eCO₂ technology
- Application engineering

Indoor Air Quality Ratings

Renesas IAQ Rating	Reference Level*	Air Information	TVOC (mg/m ³)	Air Quality
≤ 1.99	Level 1	Clean Hygienic Air (Target Value)	< 0.3	Very Good
2.00 - 2.99	Level 2	Good Air Quality (if no threshold is exceeded)	0.3 - 1.0	Good
3.00 - 3.99	Level 3	Noticeable Comfort Concerns (Not recommended for exposure > 12 months)	1.0 - 3.0	Medium
4.00 - 4.99	Level 4	Significant Comfort Issues (Not recommended for exposure > 1 months)	3.0 - 10.0	Poor
≥ 5.00	Level 5	Unacceptable conditions (Not recommended)	> 10.0	Bad

* Based on a study by the German Environment Agency (UBA).

ZMOD4410 Firmware

IAQ Firmware	Application
ZMOD4410 - IAQ 1st Gen	Traditional IAQ algorithms for gas sensors
ZMOD4410 – IAQ 2nd Gen	AI technology for improved ppm TVOC, eCO ₂ and IAQ functionality
ZMOD4410 – Odor	Control signal based on air quality changes
ZMOD4410 – Sulfur Odor	Sulfur odor discrimination

To request samples, download documentation or learn more, visit: idt.com/ZMOD4410



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