

ENVIRONMENTAL SENSING SOLUTIONS

Sensing solutions for a connected world



SENSOR OVERVIEW

ZMOD4410 INDOOR AIR QUALITY

FIRMWARE CONFIGURABLE PLATFORM

FEATURES

- JEDEC JESD47 qualification – 10 year life
- Precalibrated to UBA German Environmental Agency Air Quality (AQ) Standard
- 6 Firmware configurations released, absolute output and relative output
- Siloxane resistant
- Miniature 3mm x 3mm x 0.9mm with IP67 waterproof available
- Embedded Artificial Intelligence leveraging Neural Network training
- Estimated CO₂



ZMOD4410 Indoor Air Quality (IAQ) Firmware Configurable Applications

Firmware	Function
IAQ 2nd gen	Absolute TVOC, IAQ and eCO2 functionality
Ultra-Low Power (ULP)	Absolute TVOC, IAQ and eCO2 functionality
Odor	Relative control signal based on air quality and odor changes
Sulfur Odor	Sulfur odor discrimination

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)

ZMOD4510 OUTDOOR AIR QUALITY

FIRMWARE CONFIGURABLE PLATFORM

FEATURES

- JEDEC JESD47 qualification – 10 year life
- Precalibrated to EPA Air Quality (AQ) Standard
- Firmware configuration released, additional solutions
- Absolute output
- Siloxane resistant
- Miniature 3mm x 3mm x 0.9mm with IP67 waterproof available
- Embedded Artificial Intelligence leveraging Neural Network training



ZMOD4510 Outdoor Air Quality (OAQ) Firmware Configurable Applications

Firmware	Function
OAQ 2nd gen	Air quality measurements according to EPA standard for NO2 and ozone (non-selective)
OAQ 1st gen	Selective ozone measurements featuring ultra-low power and fast sample rate

AIR POLLUTION

OZONE
PARTICULATE MATTER
SO₂
NO_x

VOLATILE ORGANIC COMPOUNDS

ZMOD4510 Output of AQI Index

Air Quality Index (AQI)	Level of Concern and Air Quality Condition	NO ₂ Concentration [ppb]	O ₃ Concentration [ppb]	Color Code
0 to 50	Good	0 to 53	0 to 62	Green
51 to 100	Moderate	54 to 100	63 to 124	Yellow
101 to 150	Unhealthy for Sensitive Groups	101 to 360	125 to 164	Orange
151 to 200	Unhealthy	361 to 649	165 to 204	Red
201 to 300	Very unhealthy	650 to 1249	205 to 404	Purple
301 to 500	Hazardous	1250 to 2050	405 to 604	Maroon

*Based on Environmental Protection Agency's (EPA) Air Quality Index (AQI)

HS300X HUMIDITY AND TEMPERATURE SENSOR

HIGH RH ACCURACY AND LONG TERM STABILITY

FEATURES

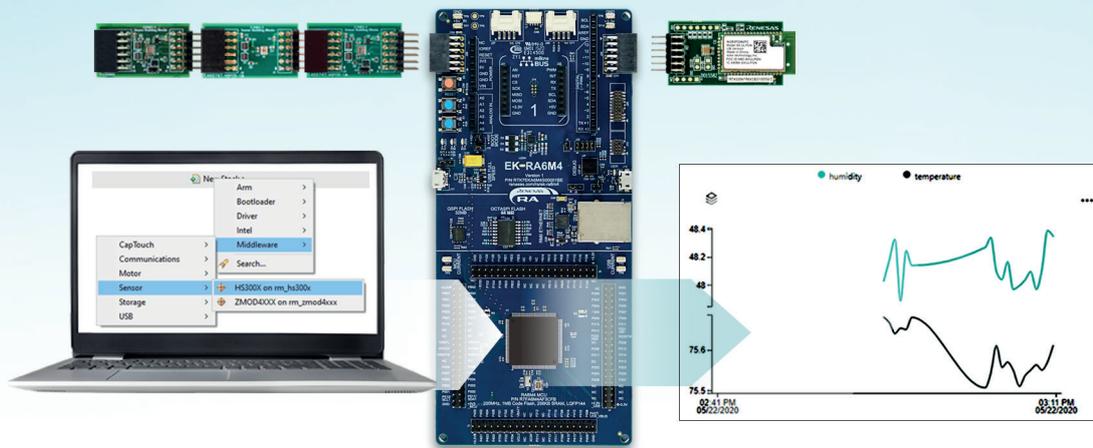
- $\pm 1.5\%$ relative humidity accuracy (HS3001)
- Fast RH response time (Typical 3-6 seconds)
- 14-bit resolution, 0.01% RH (Typical)
- Low power consumption, 1.0 μ A average (one RH + T measurement per second)
- Temperature sensor accuracy of $\pm 0.2^\circ\text{C}$ (HS3001, HS3002)
- Extended supply voltage, 1.8 to 5.5 V



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