

MEMS-based Air Quality Sensor (RSM411)

1. Features

- High sensitivity Air contaminant gases
 - CO / Ethanol / HCHO / etc.
- Surface mount package
- Low power consumption
 - Less than 45mW @ 1.7V supply
- Small size
 - MEMS-based semiconductor process
 - 3.2 x 2.5x0.99 mm Ceramic package

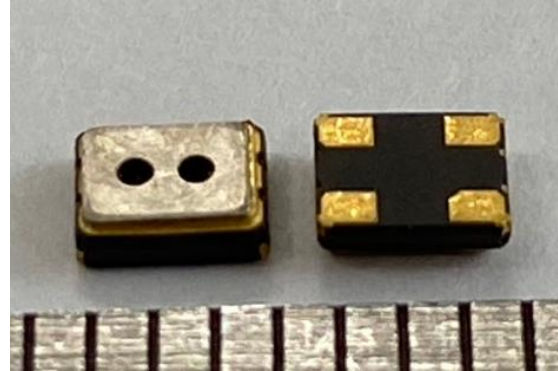
2. Applications

- Indoor Air Quality Systems
- Air Cleaners
- IoT Devices
- Ventilation Control

3. Description

The RSM411 is a Micro Electro Mechanical Systems (MEMS) based Air Quality Sensor which offers miniaturization and low power consumption. It can detect the gaseous air contaminants (CO / Ethanol / HCHO / etc.). In the sensor, the sensing materials are placed on the micro—heater, and the resistance of the sensing material is varied according to the concentration of the air pollution gases. The RSM411 is fabricated on the ceramic package with several holes. It can reduce the influence of interference gases as well as protect from humidity or dust.

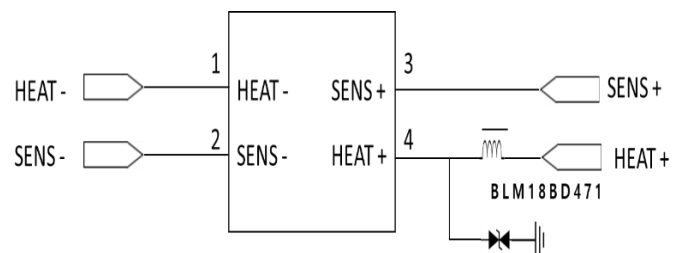
4. Package Information



Ceramic Package 4 Leads

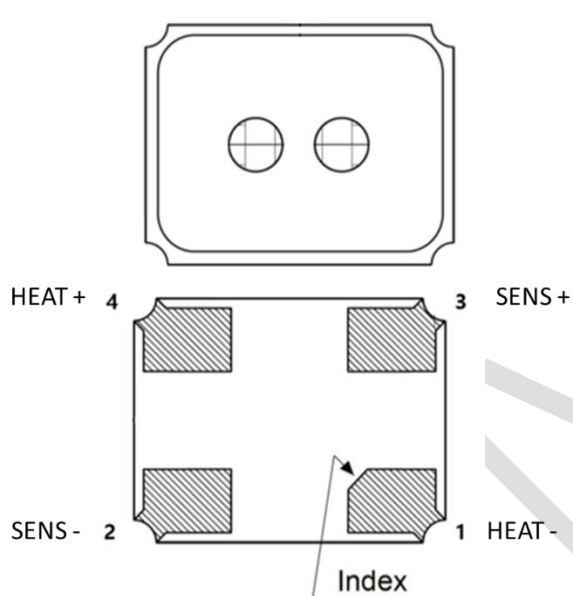
Part Name	Package	Size (mm)
RSM411	4 Lead (Ceramic)	3.2x2.5x0.99

Typical application circuit



5. Pin Configuration & Functions

Top view pin map



Note: A. External diode and bead are suggested on 4 pin.

Pin Functions

PIN			I/O ⁽¹⁾	FUNCTION
NAME	NO.		I/O	
HEAT -	A1	1	G	Negative input of heater
SENS -	A2	2	G	Negative output of sensor
SENS +	A3	3	O	Positive output of sensor
HEAT +	A4	4	P	Positive output of heater

(1) I=input, O=output, I/O=input and output, P=power supply, G=ground

6. Specifications

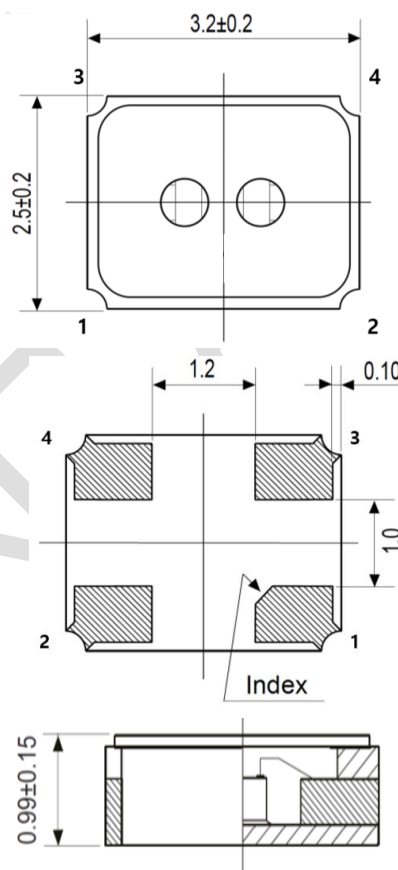
Sensing Principle		MOS Type (MEMS)
Package		4Leads Ceramic
Target Gases		CO / Ethanol / HCHO / etc.
Typical Detection Range		1~25ppm CO
Electrical Characteristics Under Standard test Conditions	Heater Voltage	1.7V DC
	Heater Resistance	Approx. 40Ω at Room Temp
	Heater Current	26mA
	Heater Power Consumption	45 mWatt (typical)
	Sensor Resistance	10KΩ ~500KΩ in Air
	Sensitivity (change ration of Rs)	~0.5 (Rs / Rs air @CO 10ppm)
Standard test Conditions	Conditioning period before test	Normal air at 25 ± 2°C, 60 ± 5% RH
	Pre-heating time	More than 12 hours

7. Application Guide (Design Support)

Since the output of the RSM411 is a resistance, a conventional measurement part should have a current source in parallel with the output of the sensor to convert the resistance to voltage. For ESD protection, the diode or bead is also suggested in the power pin. Its configuration is illustrated in the typical application diagram.

8. Package Structure and Dimensions

Unit : mm



9. Note

