RSM741 – Methane (CH_4) Sensor

RSM741 for the detection of Methane (CH_4)

RSM741 is a semiconductor type gas sensor which combines very high sensitivity to methane gas with low power consumption and long life. RSM741 requires a heater current of only 56mA and the device is housed in a standard TO-5 package.

The **RSM741** is metal oxide semiconductor type sensor in which a sensor layer and a heater layer are formed on an alumina substrate. It can detect the methane (CH4) gas in the sensor, the sensing materials are placed on the alumina substrate, and the resistance of the sensing material is varied according to the concentration of the methane (CH4) gas.

RSM741-T0 for gas leakage checkers. **RSM741-T5** uses filter material in its housing which eliminates the influence of interference gases such as alcohol, resulting in highly selective response to methane gas. This feature makes the sensor ideal for residential gas leakage detectors which require durability and resistance against interference gas.

CONTENTS

1. FEATURES

- Low power consumption
  - Approx. 300mW @ 5.0V supply
- High sensitivity to Methane gas
- Small size
  - Metal Can Package (TO-5)
- Uses simple electrical circuit
- Low cost

2. APPLICATIONS

- Portable gas detectors
- IoT devices
- Ventilation control
- Gas alarm device

FIGURE 1. RSM741-T0

Device information

Part No	Package	Size (mm)
RSM741	TO-5 metal can	Φ9.1 x 7.2

The figure below represents typical sensitivity characteristics. All data having been gathered at standard test conditions (see reverse side of this sheet). The Y-axis is indicated as sensor resistance ratio (R_S/R_O) which is defined as follows:

- R_S=Sensor resistance in displayed gases at various concentrations
- R_O=Sensor resistance in fresh air

RSM741-T0 SENSITIVITY CHARACTERISTICS:

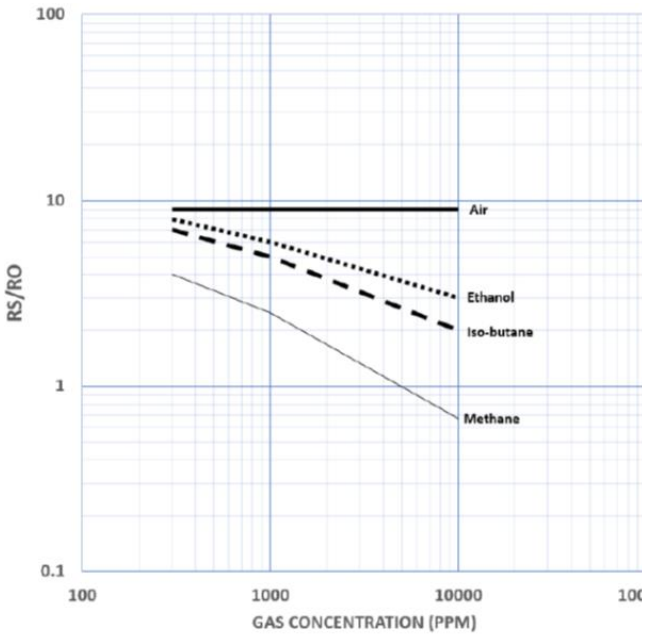


FIGURE 2. SENSITIVITY OF RSM741-T0

RSM741-T5 SENSITIVITY CHARACTERISTICS:

3. DESCRIPTION

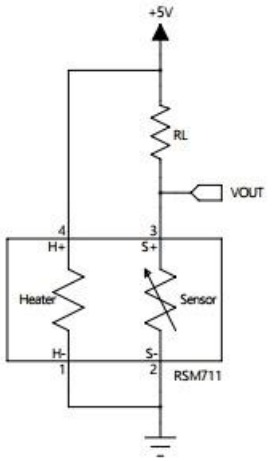
RSM741 is a semiconductor type gas sensor which combines very high sensitivity to methane gas with low power consumption and long life. RSM741 requires a heater current of only 56mA and the device is housed in a standard TO-5 package. The RSM741 is metal oxide semiconductor type sensor in which a sensor layer and a heater layer are formed on an alumina substrate. It can detect the methane (CH4) gas in the sensor, the sensing materials are placed on the alumina substrate, and the resistance of the sensing material is varied according to the concentration of the methane (CH4) gas.

RSM741-T0 for gas leakage checkers. **RSM741-T5** uses filter material in its housing which eliminates the influence of interference gases such as alcohol, resulting in highly selective response to methane gas. This feature makes the sensor ideal for residential gas leakage detectors which require durability and resistance against interference gas.

Basic measuring Circuit

The sensor requires voltage input: Heater voltage (+5V). The heater voltage (H+, H-) is applied to the integrated heater in order to maintain the sensing element at a specific temperature which is optimal for sensing.

Also, input voltage (+5V) is applied to allow measurement of of voltage across a load resistor (R_L) which is connected in series with the sensor. The value of the load resistor (R_L) should be chosen to optimize the alarm threshold value, keeping power consumption of the semiconductor below a limit of 300mW. Power consumption will be highest when the value of Rs is equal to RL on exposure to gas.



4. SPECIFICATIONS

Model			RSM741
Sensing principle			MOS type
Standard package			TO-5 metal can
Target gases			Methane (CH_4)
Typical detection range			500~10,000 ppm
Electrical characteristics under std test conditions	Heater voltage	V_H	5.0 V DC
	Heater Resistance	R_H	Approx. 59 Ω at RT
	Heater Current	I_H	56±5 mA
	Heater Power consumption	P_H	280±25 mW (typical)
	Sensor Resistance	R_S	0.5~5.0 MΩ in Air
	Sensitivity (change ratio of R_S)		~0.5 (Rs-gas / Rs-air @CH_4 10,000 ppm)
Standard test conditions	Test gas conditions		Normal air at 25±2℃, 40±5% RH
	Circuit conditions		Same as std circuit conditions
	Conditioning period before test		3-days or longer

5. APPLICATION GUIDE

Heater voltage is applied to the heater to maintain a specific temperature at which the sensing material is optimized for detection. DC voltage is required for the circuit.

Since the output of the sensor 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.

The change of the sensor resistance (R_S) is obtained as the change of the output voltage across a load resistor (R_L) which is connected in series with the sensor.

6. PIN CONFIGURATION AND DIMENSIONS

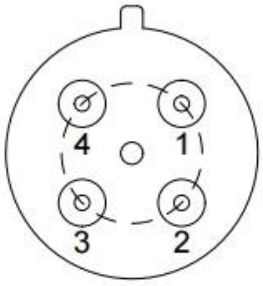


FIGURE 3. PIN CONFIGURATION

Pin functions

PIN		Type[1)]	FUNCTION
NAME	NO.	I/O	
HEAT-	1	G	Negative
SENS-	2	G	Negative
SENS+	3	O	Positive
HEAT+	4	P	Positive

1) Type: I=input, O=output, I/O=input and output, P=power supply, GND=ground

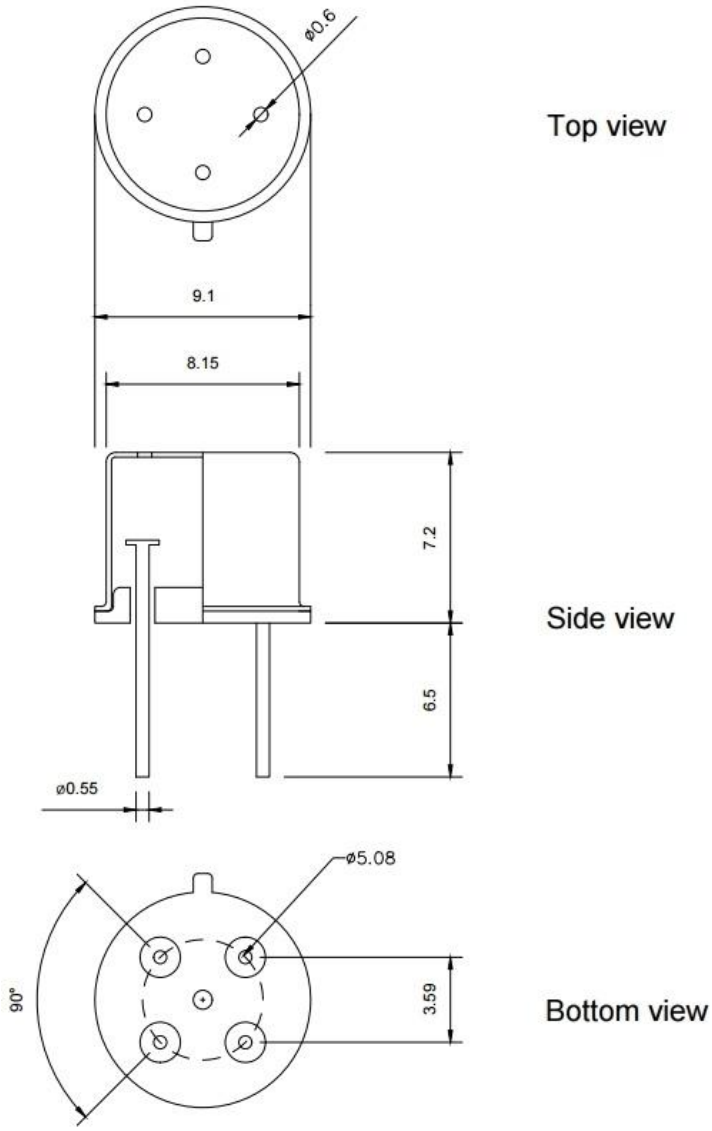
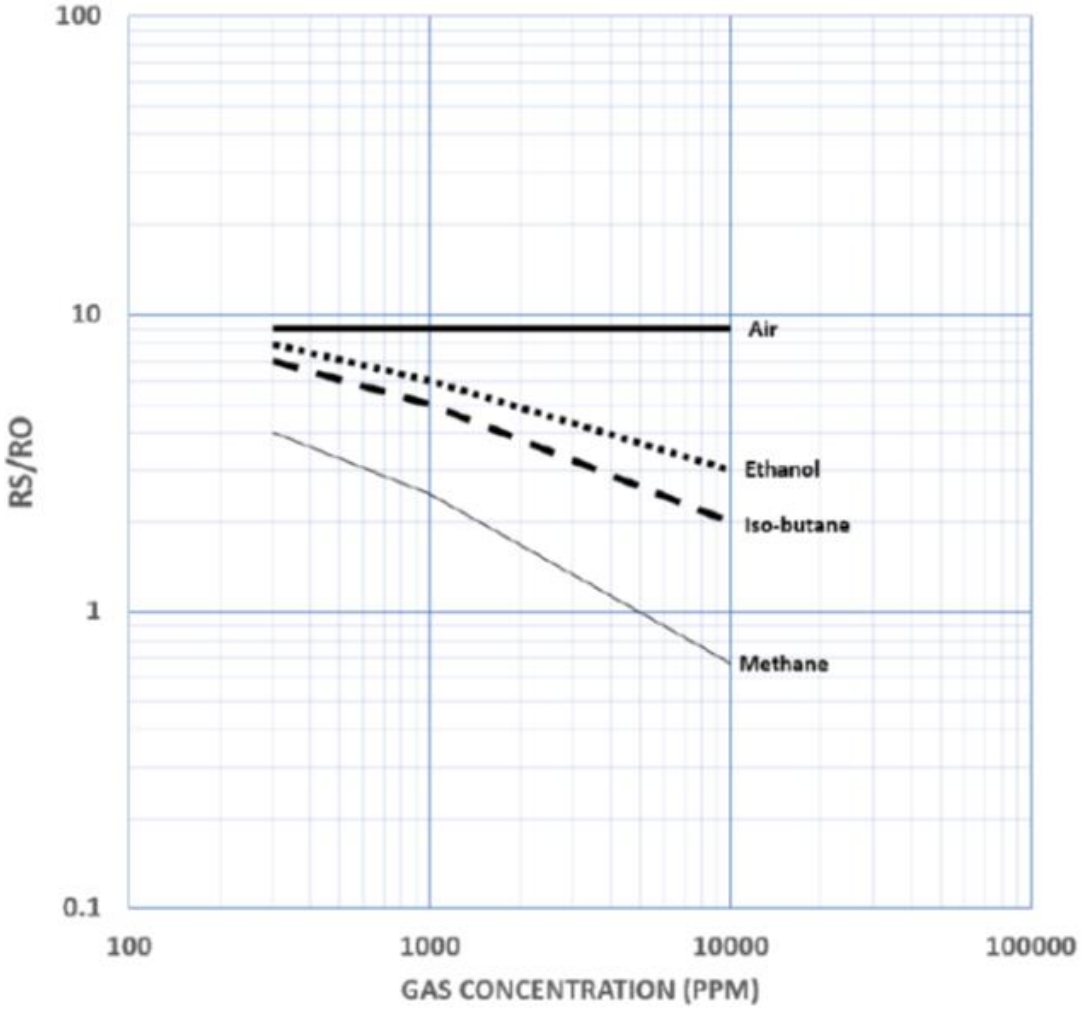


FIGURE 4. PACKAGE DIMENSION

7. TYPICAL CHARACTERISTICS



- Rs = Sensor resistance in displayed gases at various concentrations
- Ro = Sensor resistance in fresh air

8. REVISION HISTORY

Version	Descriptions
v0.1	Initial issuance

For inquiries about Gas Sensor products, please contact us below.

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