

General Description

The OIF2 thermal mass air flow sensor provides an in-line bi-directional flow measurement and is based on one silicon chip.

It consists of a silicon micromachined mass air flow sensor with a thermally-isolated film microbridge structure and two temperature sensing elements.

The thermal mass air flow sensor makes use of the heat transfer measurement method. When a gas is flowed through the inlet and outlet ports, the sensing elements positioned on both sides of a central heater measure the temperature difference between the upstream edge and the downstream edge. The temperature difference is a function of the flow rate.

The analog output signal is unamplified and very simple to process. The airflow measurement can be easily controlled by means of a dual Wheatstone bridge configuration. One bridge, which contains the heater resistor and the heat-sunk resistor, provides a constant temperature control. The other bridge contains the temperature sensing elements. The output voltage corresponds to the differential voltage across the sensor bridge circuit and varies in proportion to the mass flow.

The advantage of the microbridge structure is to provide a sensitive, fast and repeatable response to a flow as well as an excellent thermal isolation and low differential pressure sensing.

Applications

Automotive (Air/Gasoline Mixture, Air Conditioning)

Heating, Ventilation, and Air Conditioning Systems (H.V.A.C)

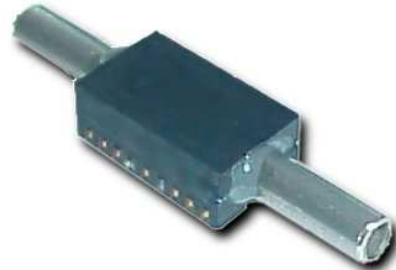
Biomedical (Respirators, Ventilators,...)

Environmental Climate Control

Gas Analyzers and Metering

Mass Flow Controllers

Leak Detection Equipment

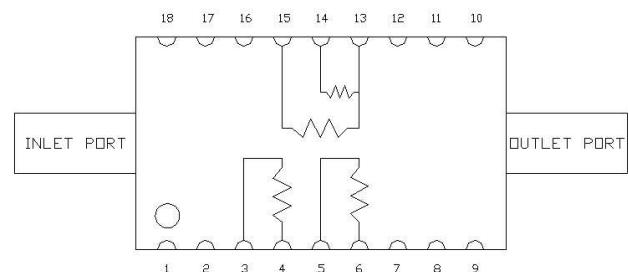


Features

- Precision Silicon Micromachined Sensor
- Bi-directional Measurement
- Flow Sensing Range 200 sccm
- Highly Stable and Sensitive
- Fast Response Time
- Low Power Consumption
- Unamplified Analog Output
- Compact Package Design

Pin Functions

No.	Name	Function
3-4	Rup	Upstream Temperature Sensor Resistor
5-6	Rdwn	Downstream Temperature Sensor Resistor
13-14	Rhs	Heat-sunk Resistor
13-15	Rh	Heater Resistor
Others	NC	Not Connected



Ordering Information

OIF2 Thermal Mass Air Flow Sensor

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Unit
P _t	Total Power Dissipation		100	mW
P ₀	Over Pressure		25	psi
T _A	Operating Temperature Range	0	70	°C
T _S	Storage Temperature	-40	+80	°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

T_A = 25°C, unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _S	Supply Voltage			10		V
R _{NG}	Full Scale Flow Range	V _S =10 V			200	sccm
P _C	Power Consumption	V _S =10 V		30		mW
R _H	Heater Resistance			950		Ω
R _{HS}	Heat-Sunk Resistance			5400		Ω
R _S	Temperature Sensor Resistance			1150		Ω
T _{CR}	Temperature Coefficient Sensor Resistance			1050		ppm/°C

MECHANICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
D _{in}	Inlet/Outlet pipe inside diameter			2		mm
D _{out}	Inlet/Outlet pipe outside diameter			3		mm