

MEMS Flow Sensor

Model SFD COB Form

FEATURES

- MEMS Thermopiles & Heater
- Excellent wetted parts compatibility
- No offset and Drift
- Pressure Resistant, >15 bar
- Simple Signal Conditioning



APPLICATIONS

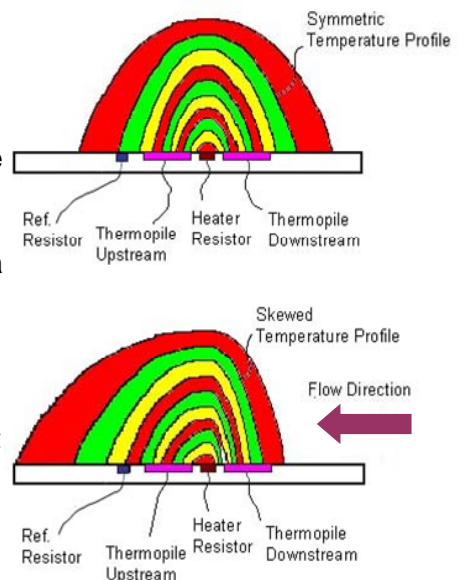
- Medical respirators and ventilators
- HVAC
- Process Control

DESCRIPTION

The SFD flow sensing die consists of two thermopiles symmetrically positioned upstream and downstream from a heater element which heats up the hot junctions. The thermopile generates an output voltage proportional to the temperature gradient between its hot and cold junctions (the Seebeck effect). The hot junctions of the thermopiles and the heater reside on a thermal isolation base.

In case the medium is static, the temperature profile upstream and downstream from the heater is symmetric; In case the medium flows, the temperature profile skews in the flow direction due to heat transport of the flowing medium, causing changes in thermopile output. Heat transport is proportional to mass flow and heat capacity of the medium. Therefore the sensor measures the mass flow of the medium

A reference resistor is placed next to the cold junction of the upstream thermopile to provide input for temperature compensation.



ADVANTAGE

The thermopile generates voltage output without biasing. As a result, there is no offset as well as offset drift. Excellent noise immunity to power supply is also gained.

Each thermopile consists of 20 thermocouples in series to reveal the highest level of sensitivity.

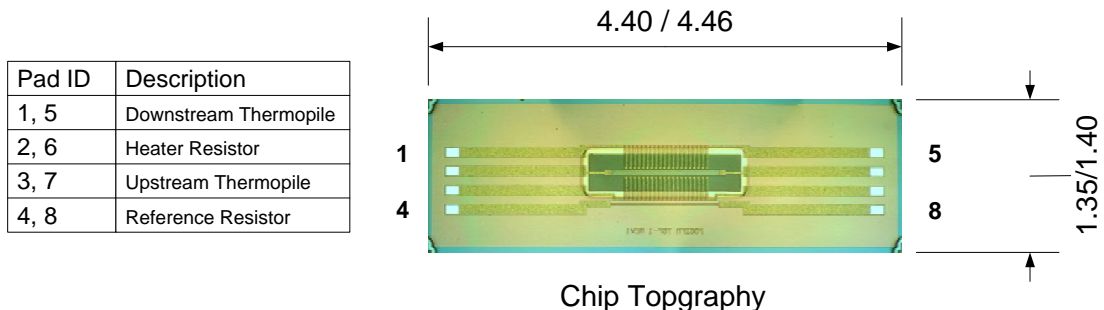
The unique thermal isolation design does not require thin membrane or surface cavity. As a result, the die can withstand pressure shock, and optional ceramic film is applicable to protect the sensor from corrosive gases/liquids and abrasive wear.

Free of surface cavity also allows the sensor to be used for liquid flow measurement.

CHARACTERISTICS

PARAMETERS	MIN	TYP	MAX	UNIT
Resistance - Heater	2.8	3.0	3.25	
Resistance - Reference	7209	7398	7722	
Resistance - Thermopile @25°C	60	62	65	k
TCR - Reference		- 578		ppm / °C
Exciting Current - Heater		6.5		mA
Output - Upstream @25°C, Air	157	165	177	mV
Output - Downstream @25°C, Air	157	165	177	mV
Response Time		< 10		mS
Null Drift		0.2		%FS/Yr
Temperature - Operating	- 20		105	°C
Temperature - Storage	- 40		125	°C
Over Pressure	15			bar

DIMENSION



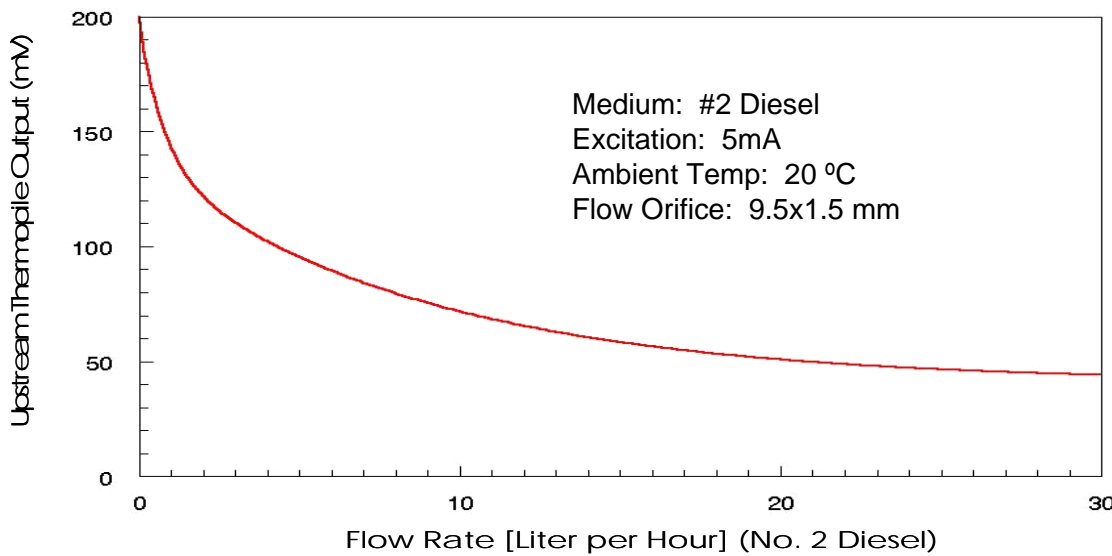
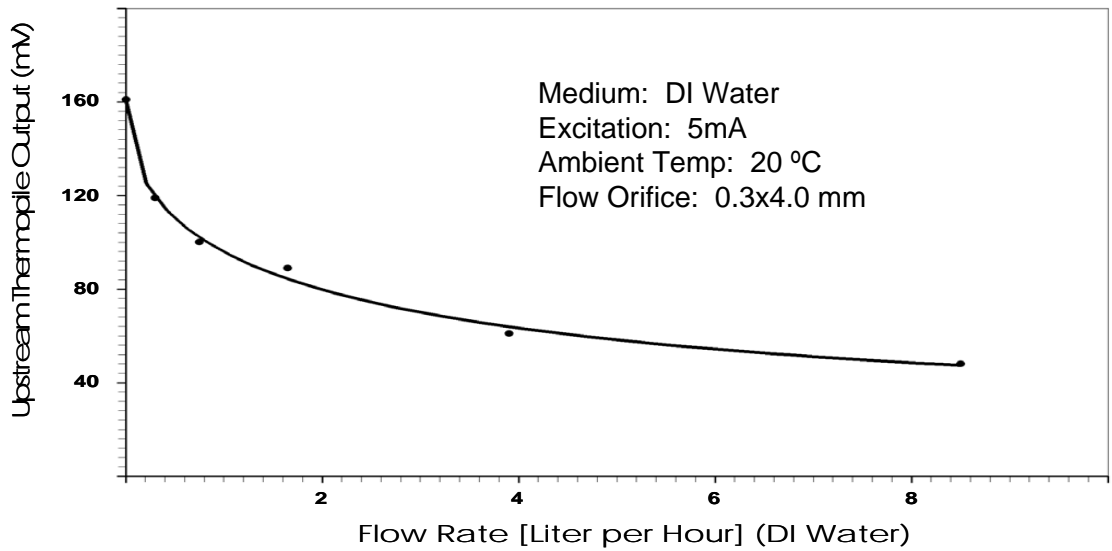
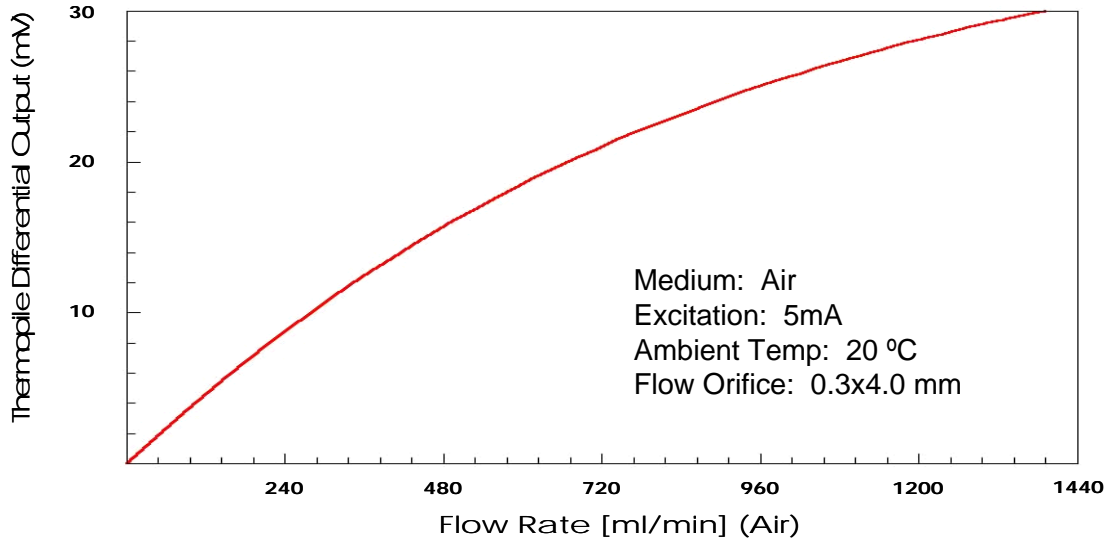
Note:

The flow sensor is being sold and shipped in chip-on-board.

Customized thin film ceramic substrate is available upon request.

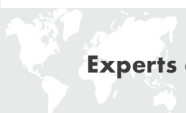
Please contact factory for the design guideline.

TYPICAL OUTPUT



NOTES:

NG is dedicated to clean air. However NG can resist water condensation, dust particles, and corrosive chemical traces in the air. It can also be cleaned with DI water and IPA. What it cannot do is to operate (with heating current) while being immersed in DI water for an extended period of time.



Headquarter Switzerland:
Angst+Pfister Sensors and Power AG

Thurgauerstrasse 66
CH-8050 Zurich
Phone +41 44 877 35 00
sensorsandpower@angst-pfister.com

Office Germany:
Angst+Pfister Sensors and Power
Deutschland GmbH
Edisonstraße 16
D-85716 Unterschleißheim
Phone +49 89 374 288 87 0
sensorsandpower.de@angst-pfister.com



We are here for you. Addresses and Contacts.

Sales Germany & Austria

Geometrical sensors
Other products

Kurt Stritzelberger
Phone +49 89 374 288 87 22
kurt.stritzelberger@angst-pfister.com

Pressure sensors
Other products

Gerhard Vetter
Phone +49 89 374 288 87 26
gerhard.vetter@angst-pfister.com

Gas sensors and modules

Peter Felder
Phone +41 44 877 35 05
peter.felder@angst-pfister.com

Sales Switzerland & Liechtenstein

Postcode 3000 – 9999

Basil Frei
Phone +41 44 877 35 18
basil.frei@angst-pfister.com

Postcode 1000 – 2999

Christian Mohrenstecher
Phone +41 76 444 57 93
christian.mohrenstecher@angst-pfister.com

Sales International Key Accounts

Peter Felder
Phone +41 44 877 35 05
peter.felder@angst-pfister.com

Sales Other Countries / Product Management

Pressure Sensors
Load Cells

Philipp Kistler
Phone +41 44 877 35 03
philipp.kistler@angst-pfister.com

Gas sensors
Gas sensor modules

Dr. Thomas Clausen
Phone +49 89 374 288 87 24
thomas.clausen@angst-pfister.com

Flow / Level / Medical products

Dr. Adriano Pittarelli
Phone +49 89 374 288 87 67
adriano.pittarelli@angst-pfister.com

Power supplies

Sebastiano Leggio
Phone +41 44 877 35 06
sebastiano.leggio@angst-pfister.com

Linear position sensors
Angle sensors

Eric Letsch
Phone +41 44 877 35 14
eric.letsch@angst-pfister.com

Accelerometers
Sensor elements

Christoph Kleye
Phone +49 89 374 288 87 61
christoph.kleye@angst-pfister.com

Drive technology
CH Postcode 5000 – 9999 / DE

Roman Homa
Phone +41 76 444 00 86
roman.homa@angst-pfister.com

Drive technology
CH Postcode 1000 – 4999 / AT / IT / FR

Christian Mohrenstecher
Phone +41 76 444 57 93
christian.mohrenstecher@angst-pfister.com

Harald Thomas
Phone +49 89 374 288 87 23
harald.thomas@angst-pfister.com