PYREOS

Thin Film Pyroelectric Single Channel Sensor

Introduction

Pyreos thin film pyroelectric IR sensors for gas detection and substance concentration measurements offer exceptionally high responsivity, low microphonics and class leading thermal and electrical stability. This high performance current mode sensor achieves a signal to noise of ~10,000 and offers a fast, stable response over a wide operating frequency range. The sensor element is built into a low noise circuit that has an internal CMOS operational amplifier, with a 10 GΩ feedback resistor outputting a voltage signal centred around half the supply rail.
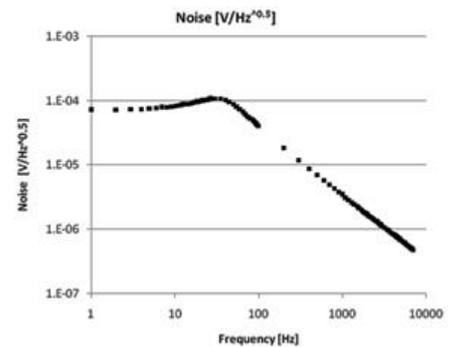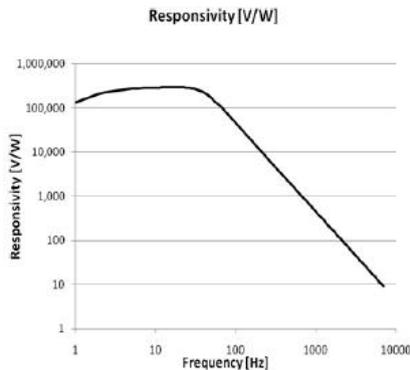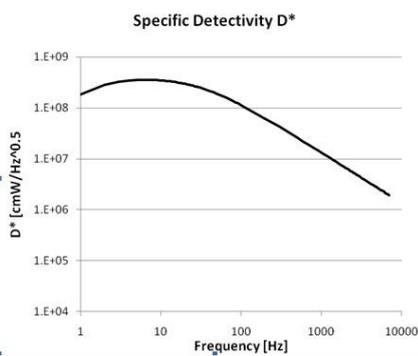
Sensor Characteristics

Filter aperture	2.5 mm ø
Element size	1000 µm x 1000 µm
Package	TO39
Responsivity [1]	150,000 V/W
D* [1]	3.5×10^8 cm√Hz/ W
Noise [1]	70 µV√Hz
Op amp with 10 GΩ feedback resistor	

Electrical Characteristics

Max. Voltage (+V)	8.0 V
Output voltage normalised around mid-rail	
Min. Voltage (+V)	2.7 V
Microphonics	S_{vib}~2 µV/ g at 10 Hz
Time Constant	~12 ms
Operating Temperature	-40 to +85 °C
Storage Temperature	-40 to +110 °C
Filter	See "Filters Available"

[1]*10 Hz, 500 K, room temperature, without window and optics*
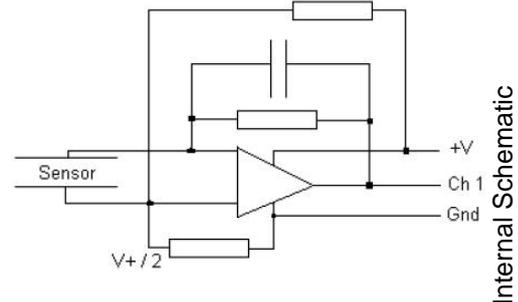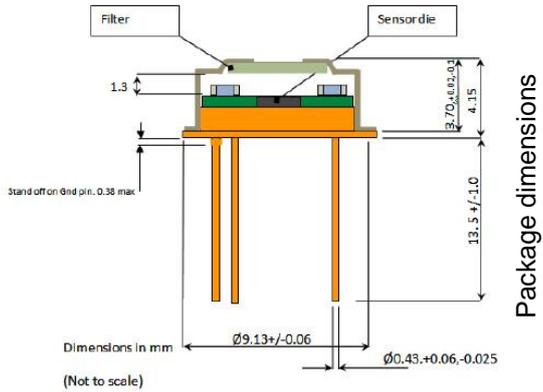
Frequency Characteristics

Specific Detectivity D*

Responsivity [V/W]

Noise [V/Hz^0.5]

Package Information

Top View

Ø2.50 +/-0.1

Sensor Pixel

Ø8.15±0.05

Ø5.0

Bottom View

Gnd

Signal

V+

Filter window size

Filter

Sensor die

1.3

3.70,+0.02,-0.1

4.15

Stand off on Gnd pin. 0.38 max

13.5 +/-1.0

Dimensions in mm

(Not to scale)

Ø9.13+/-0.06

Ø0.43.+0.06,-0.025

Package dimensions

Internal Schematic

Sensor

+V

Ch 1

Gnd

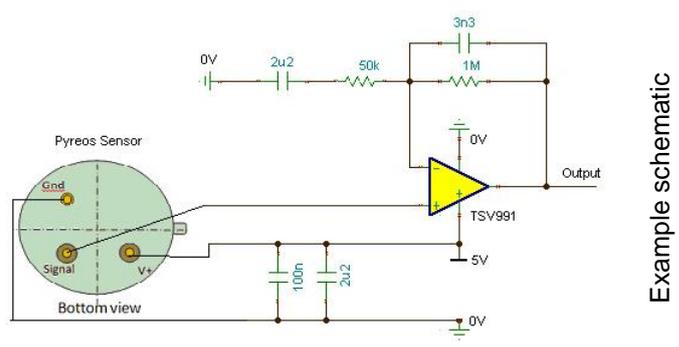V+ / 2
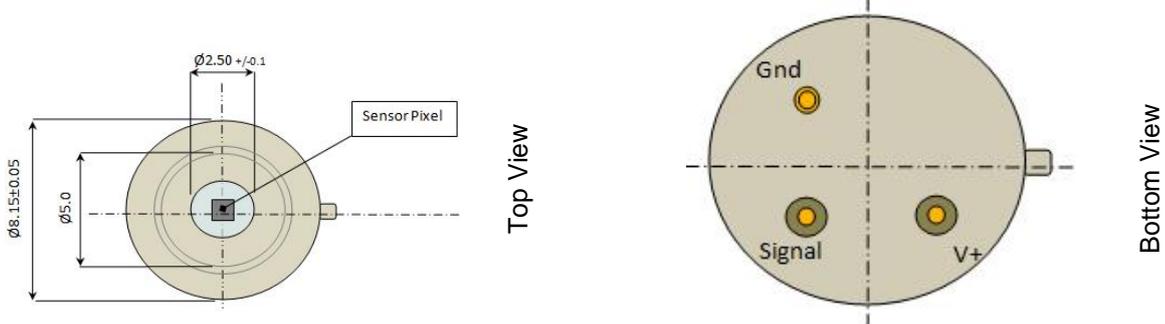
Note: Ensure that the sensor base is not in contact with the PCB in order to avoid shorts.

Recommended Circuit Diagram

Pyreos Sensor

Gnd

Signal

V+

Bottom view

0V

2u2

50k

3n3

1M

0V

TSV991

Output

5V

100n

2u2

0V

Example schematic

Filters Available

Pyreos has a range of standard filters available.

Part number	Channel 1 CWL µm / (HPB nm)	Use
PY0213	3.30 / (160)	CH_4
PY0293	3.375 / (190)	H-C
PY0275	3.91 / (90)	Reference
PY0175	4.26 / (180)	CO_2
PY1944	4.30 / (110)	CO_2 (Narrow)
PY0210	4.43 / (60)	CO_2 (Special)
PY0211	4.64 / (180)	CO
PY0212	4.64 / (90)	CO (Narrow)
PY0253	5.30 / (180)	NO
PY0254	7.30 / (200)	SO_2
PY1456	10.35 / (190)	Refrigerant R12 (Freon)
PY2214	5.0 Long Pass	Broadband for bespoke filters

Note: An additional window may be required to provide high wavelength blocking.

Order Information

Please quote PY-ITV-SINGLE–TO39(2+1) and your desired filter combination or quote specific part number PY0XXX as per filter table. Contact: sales@pyreos.com

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