

# 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

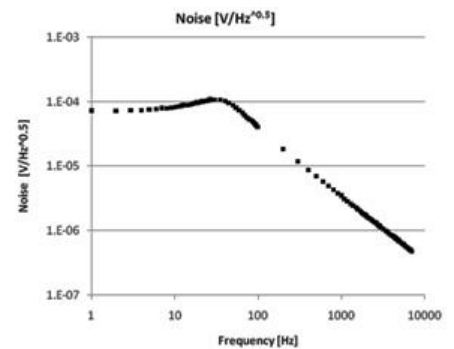
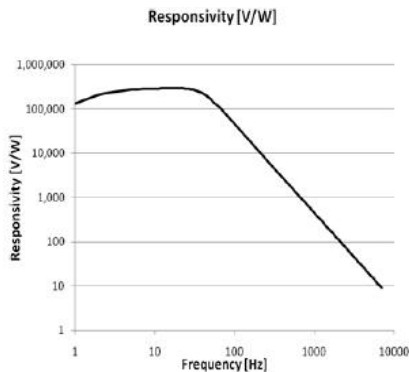
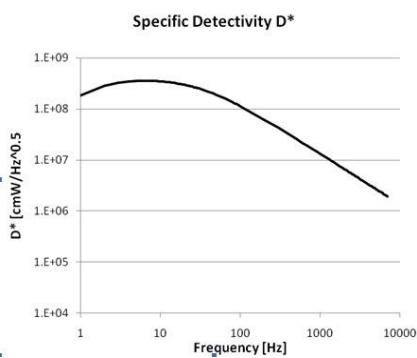
Filter aperture	2.5 mm $\varnothing$
Element size	1000 $\mu\text{m}$ x 1000 $\mu\text{m}$
Package	TO39
Responsivity <sup>1</sup>	150,000 V/W
D* <sup>1</sup>	$3.5 \times 10^8 \text{ cm}\sqrt{\text{Hz}}/\text{W}$
Noise <sup>1</sup>	70 $\mu\text{V}/\sqrt{\text{Hz}}$
Op amp with 10 GΩ feedback resistor	

### Electrical Characteristics

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

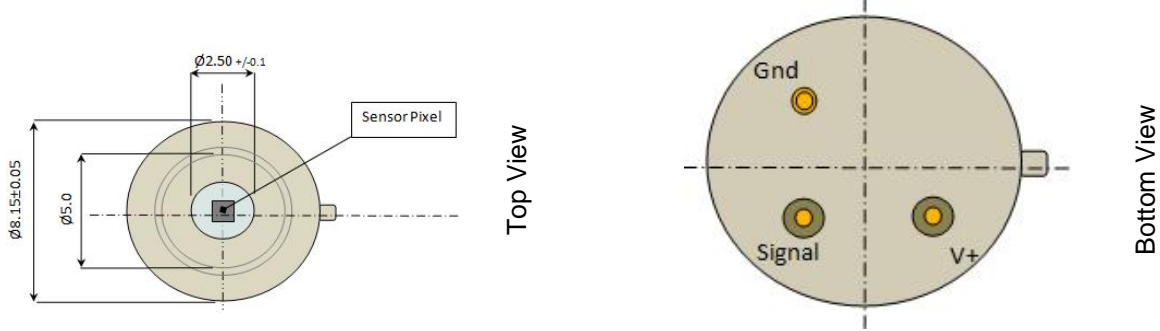
<sup>1</sup> 10 Hz, 500 K, room temperature, without window and optics

## Frequency Characteristics

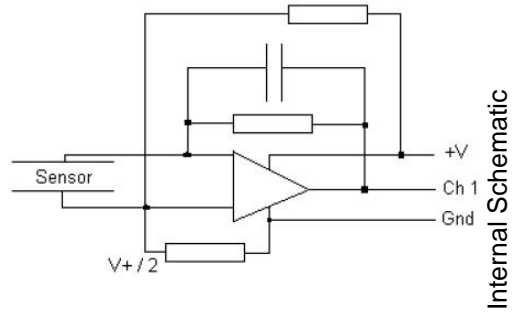
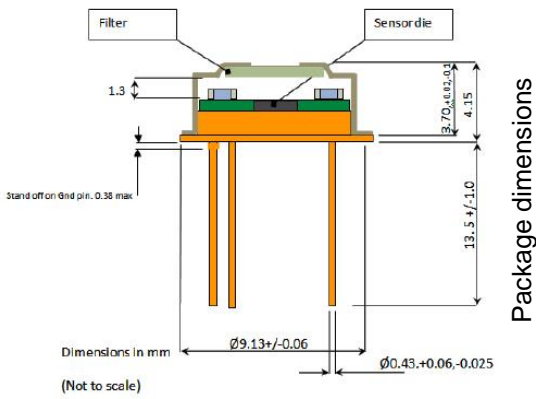


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Package Information

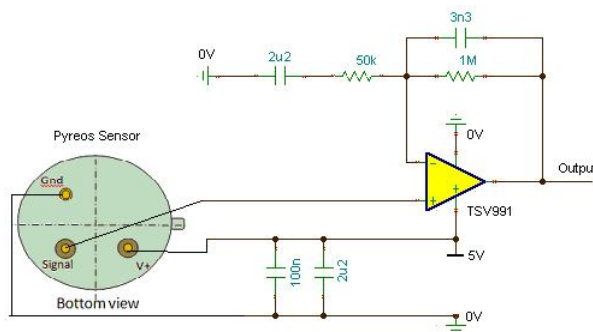


Filter window size



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

Recommended Circuit Diagram



Example schematic

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## Filters Available

Pyreos has a range of standard filters available.

Part number	Channel 1 CWL $\mu\text{m}$ / (HPB nm)	Use
PY0213	3.30 / (160)	CH <sub>4</sub>
PY0293	3.375 / (190)	H-C
PY0275	3.91 / (90)	Reference
PY0175	4.26 / (180)	CO <sub>2</sub>
PY1944	4.30 / (110)	CO <sub>2</sub> (Narrow)
PY0210	4.43 / (60)	CO <sub>2</sub> (Special)
PY0211	4.64 / (180)	CO
PY0212	4.64 / (90)	CO (Narrow)
PY0253	5.30 / (180)	NO
PY0254	7.30 / (200)	SO <sub>2</sub>
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-T039(2+1) and your desired filter combination or quote specific part number PY0XXX as per filter table. Contact: [sales@pyreos.com](mailto:sales@pyreos.com)