

Thin Film Pyroelectric Dual Channel Sensor

Introduction

Pyreos thin film pyroelectric infrared (IR) sensors for gas detection and other 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 elements are built into a low noise circuit that has an internal CMOS op amp, with a 10 GΩ feedback resistor outputting a voltage signal centred around half the supply rail.



Sensor Characteristics

Filter aperture	2.6 mm square
Element size	1000 μm x 1000 μm
Package	TO39
Responsivity ¹	150,000 V/W
D* ¹	3.5 x 10 ⁸ cm√Hz/ W
Noise ¹	70 μV√Hz

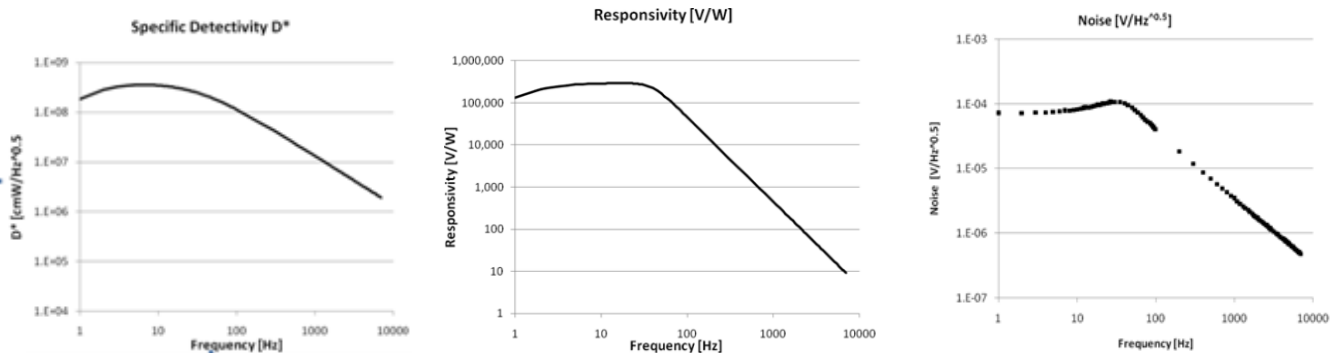
Electrical Characteristics

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

¹ 10 Hz, 500 K, room temperature, without window and optics

² Absolute maximum operating voltage

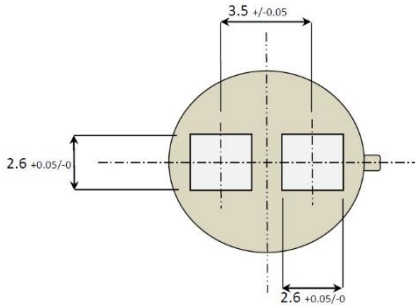
Frequency Characteristics



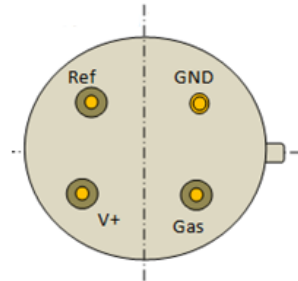
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Package Information

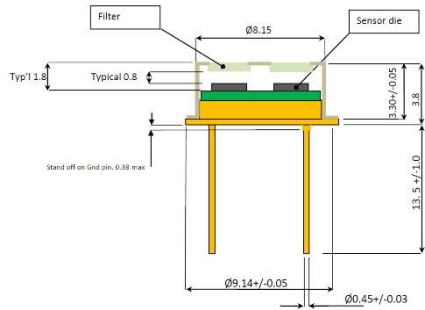
Filter window size



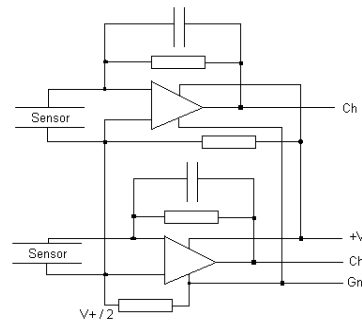
Top View



Bottom View



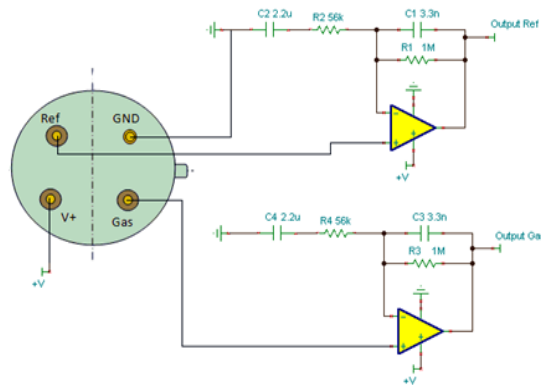
Package dimensions



Internal Schematic

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

Recommended Circuit Diagram



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Filters Available

Pyreos has a range of standard filters available.

Part number	Channel 1		Channel 2 (tab)	
	CWL μm / HPB nm	Use	CWL μm / HPB nm	Use
PY0317	3.91 / 90	Reference	3.30 / 160	CH ₄
PY2486	3.91 / 90	Reference	3.33 / 160	H-C
PY0261	3.91 / 90	Reference	3.38 / 190	H-C
PY0234	3.91 / 90	Reference	4.26 / 180	CO ₂
PY2343	3.70 / 110	Reference	4.26 / 180	CO ₂ (Medical)
PY2572	4.90 / 130	Reference	4.26 / 180	CO ₂ (Medical)
PY1943	3.91 / 90	Reference	4.30 / 110	CO ₂ (Narrow)
PY0238	3.91 / 90	Reference	4.43 / 60	CO ₂ (Special)
PY0305	3.91 / 90	Reference	4.64 / 180	CO
PY0259	3.91 / 90	Reference	4.64 / 90	CO (Narrow)
PY0304	3.91 / 90	Reference	5.30 / 180	NO
PY2055	3.91 / 90	Reference	6.20 / 200	NO ₂
PY0303	3.91 / 90	Reference	7.30 / 200	SO ₂
PY0308	3.91 / 90	Reference	10.6 / 240	SF ₆ , Ethylene
PY1466	8.44 / 205	Anaesthetic gas	4.26 / 180	CO ₂
PY1648	8.94 / 225	Refrigerants	10.36 / 190	Refrigerants R12 (Freon)
PY2197	5.60 / 80	Reference (fat)	5.73 / 80	Food - fat
PY2547	7.70 / 140	Reference (lactose)	9.61 / 150	Food - lactose
PY2550	6.70 / 120	Reference (protein)	6.46 / 130	Food - protein
PY2580	6.46 / 130	Food - protein	9.61 / 150	Food - lactose
PY2551	5.0 Long Pass	Reference	9.50 / 400	Food - sugar, breath - ethanol
PY1839	5.0 Long Pass	Broadband for bespoke filters	5.0 Long Pass	Broadband for bespoke filters
PY2737 ES2737	4.26 / (180)	CO ₂	4.64 / (180)	CO

Note: In some implementations it may be necessary to add an optical high wavelength blocking filter externally to the sensor package.

Order Information

Please quote PY-ITV-DUAL-TO39(3+1) and your desired filter combination or quote specific part number PYXXX as per filter table. Contact: sales@pyreos.com

Search terms: current mode, voltage mode, infrared detector, infrared sensor, MIR, mid-IR, thermopile, photodiode

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