

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

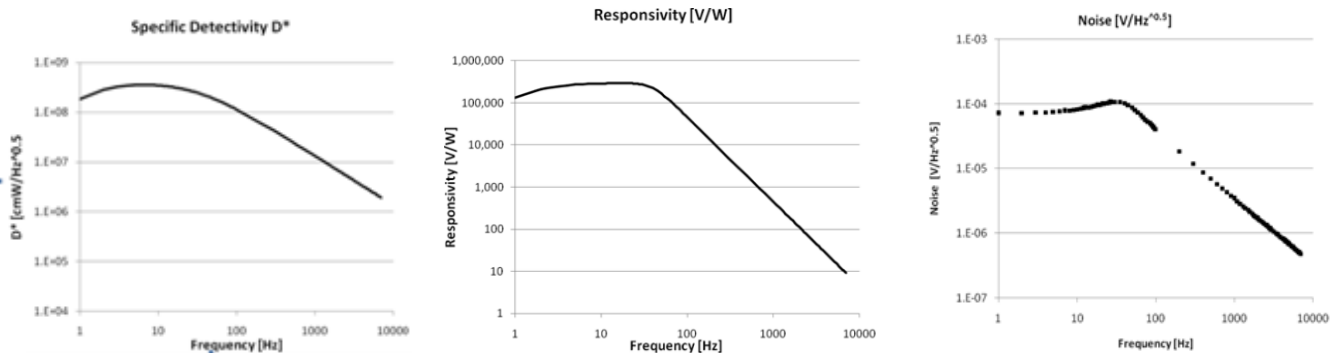
¹ 10 Hz, 500 K, room temperature, without window and optics

² Absolute maximum operating voltage

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"

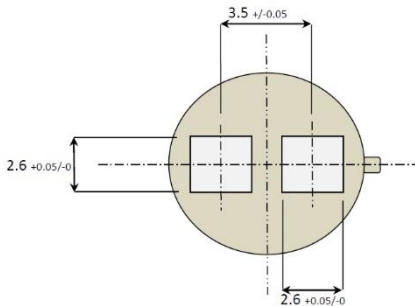
Frequency Characteristics



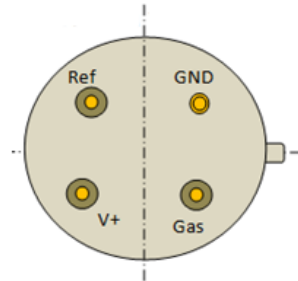
Please note: the information contained in this document is subject to change without further notification. Pyreos reserves the right to alter the performance and any resulting specification. Pyreos may choose not to supply any engineering sample devices as a commercial product. No responsibility is accepted for any consequential loss incurred. LIM-252 LIM-262 LIM-272 Pyreos Ltd, 14-16 The Curve, 32 Research Avenue North, Heriot Watt Research Park, Edinburgh EH14 4AP, UK. Tel: +44 131 322 0732, www.pyreos.com; Copyright Pyreos Ltd 2019

Package Information

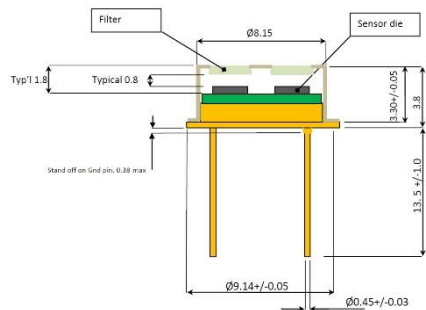
Filter window size



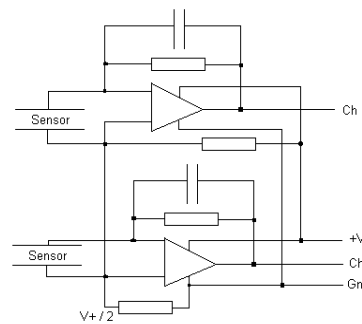
Top View



Bottom View



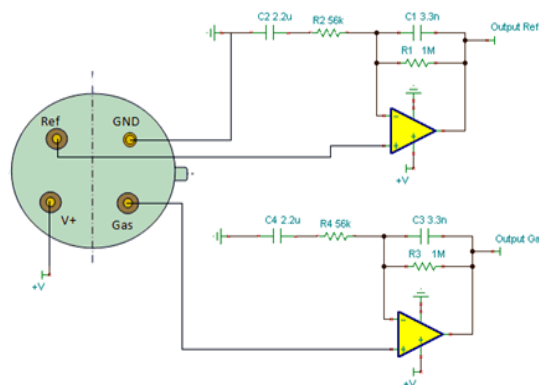
Package dimensions



Internal Schematic

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

Recommended Circuit Diagram



Please note: the information contained in this document is subject to change without further notification. Pyreos reserves the right to alter the performance and any resulting specification. Pyreos may choose not to supply any engineering sample devices as a commercial product. No responsibility is accepted for any consequential loss incurred. LIM-252 LIM-262 LIM-272 Pyreos Ltd, 14-16 The Curve, 32 Research Avenue North, Heriot Watt Research Park, Edinburgh EH14 4AP, UK. Tel: +44 131 322 0732, www.pyreos.com; Copyright Pyreos Ltd 2019

Filters Available

Pyreos has a range of standard filters available.

Part number	Channel 1 CWL μm / (HPB nm)	Channel 2 (tab) CWL μm / (HPB nm)	Use
PY0317	3.91 / (90)	3.30 / (160)	CH ₄
PY2486	3.91 / (90)	3.33 / (160)	H-C
PY0261	3.91 / (90)	3.375 / (190)	H-C
PY0234	3.91 / (90)	4.26 / (180)	CO ₂
PY2343	3.70 / (110)	4.26 / (180)	CO ₂ (Medical)
PY1466	8.44 / (205)	4.26 / (180)	Anaesthesia
PY1943	3.91 / (90)	4.30 / (110)	CO ₂ (Narrow)
PY0238	3.91 / (90)	4.43 / (60)	CO ₂ (Special)
PY0305	3.91 / (90)	4.64 / (180)	CO
PY0259	3.91 / (90)	4.64 / (90)	CO (Narrow)
PY0304	3.91 / (90)	5.30 / (180)	NO
PY2055	3.91 / (90)	6.20 / (200)	NO ₂
PY0303	3.91 / (90)	7.30 / (200)	SO ₂
PY0308	3.91 / (90)	10.6 / (240)	SF ₆ , Ethylene
PY1648	Refrigerant	Reference	Refrigerant R12 (Freon)
PY2197	Fat Reference	Fat	Food
PY2547	Lactose Reference	Lactose	Food
PY2550	Protein Reference	Protein	Food
PY2551	Reference	Sugar, Ethanol	Food, breath
PY1839	5.0 Long Pass	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-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

Please note: the information contained in this document is subject to change without further notification. Pyreos reserves the right to alter the performance and any resulting specification. Pyreos may choose not to supply any engineering sample devices as a commercial product. No responsibility is accepted for any consequential loss incurred. LIM-252 LIM-262 LIM-272 Pyreos Ltd, 14-16 The Curve, 32 Research Avenue North, Heriot Watt Research Park, Edinburgh EH14 4AP, UK. Tel: +44 131 322 0732, www.pyreos.com; Copyright Pyreos Ltd 2019