

Two channel TO-39 infrared sensors for hydrocarbon gas detection

Introduction

New in Pyreos dual TO-39 analog infrared sensor product line – optimised spectral absorption for Methane and other hydrocarbon gases leading to improved signal-to-noise ratio.

Pyreos thin film pyroelectric 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 SNR 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. The voltage signal output is centred around half the supply rail, allowing single power supply operation.



Sensor Characteristics

Aperture	2x 2.6 mm x 2.6 mm
Element size	1000 μm x 1000 μm
Package	TO39
Responsivity ^{1,2}	up to 250,000 V/W
D* ¹	3.5 x 10 ⁸ cm√Hz/ W
Noise ¹	130 μV√Hz
Microphonics	S _{vib} ~2 μV/ g at 10Hz
Time Constant	~12 ms

Electrical Characteristics

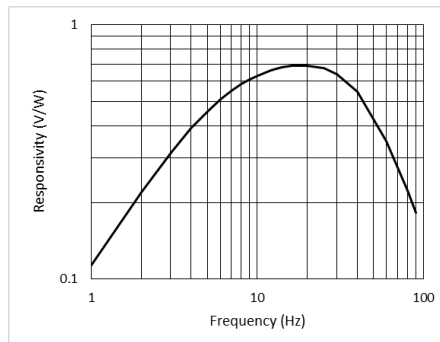
Max. Voltage (+V) ³	8.0 V
Min. Voltage	2.7 V
Output voltage normalised around mid-rail	
Supply Current	90 μA typ @ 5 V
Operating Temperature	-40 to +85 °C
Storage Temperature	-40 to +110 °C
Filters	See "Filters Available"

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

² Refer to product list at the end of this datasheet for product wavelength specific characteristics

³ Absolute maximum operating voltage

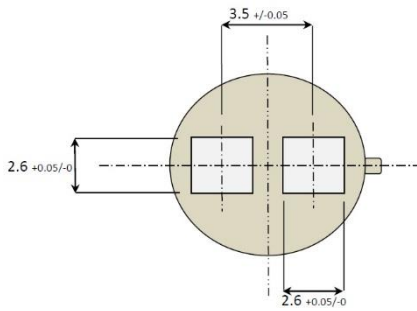
Frequency Characteristics



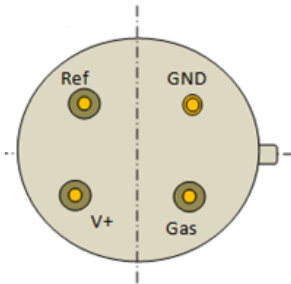
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Package Information

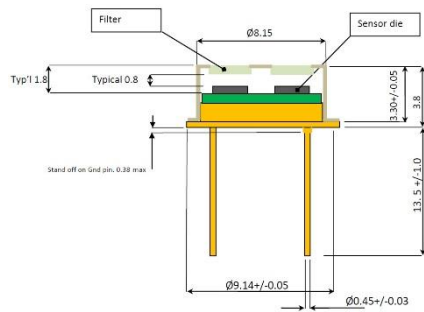
Filter window size



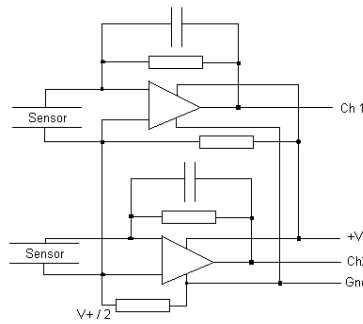
Top View



Bottom View



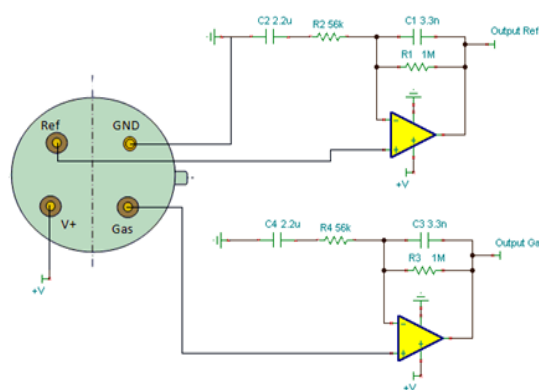
Package dimensions



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	Channel 1, Channel 2 In-Band Responsivity ¹	Broadband Responsivity (no filter)
ES2626	3.91 / (90), 3.30 / (160)	CH ₄	355 000 V/W, 267 000 V/W	167 000 V/W
tbc	3.91 / (90), 3.33 / (160)	H-C	355 000 V/W, tbc	167 000 V/W
tbc	3.91 / (90), 3.375 / (190)	H-C	355 000 V/W, tbc	167 000 V/W

¹ For the purpose of calculating the in-band responsivity, the incident radiation power is calculated as a proportion of the 500 K blackbody radiation available within the nominal filter wavelength range - e.g. for a 3.30/160 filter this would be from 3.28 to 3.38 μm

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

Order Information

Please quote PY-DUAL–TO39(3+1) and your desired filter combination or quote specific part number ESXXXX or 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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