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Thin Film Pyroelectric Dual Channel Sensor

Introduction

Broadcom® 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 centered around half the supply rail.



Sensor Characteristics

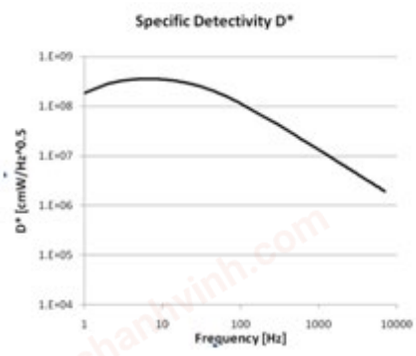
Filter aperture	2.6 mm square
Element size	1000 µm x 1000 µm
Package	TO39
Responsivity [1]	150,000 V/W
D* [1]	3.5 x 10^8 cm√Hz/ W
Noise [1]	70 µV√Hz

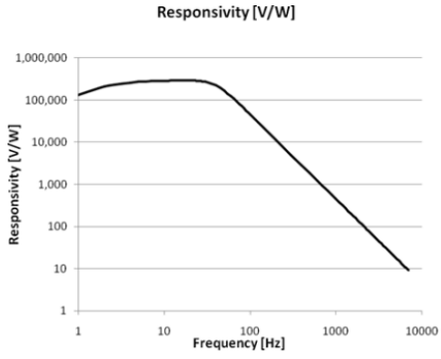
Electrical Characteristics

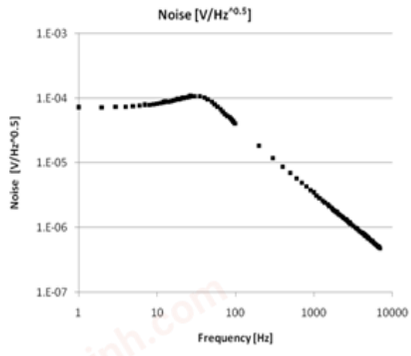
Max. Voltage (+V) [2]	8.0 V
Min. Voltage	2.7 V
Output voltage normalized around mid-rail	
Microphonics	S_{vib}~2 µV/ g at 10 Hz
Time Constant	~12 ms
Operating Temperature	–40 to +85 °C
Storage Temperature	–40 to +110 °C
Filters	See "Filters Available"

[1] 10 Hz, 500 K, room temperature, without window and optics
[2] Absolute maximum operating voltage

Frequency Characteristics



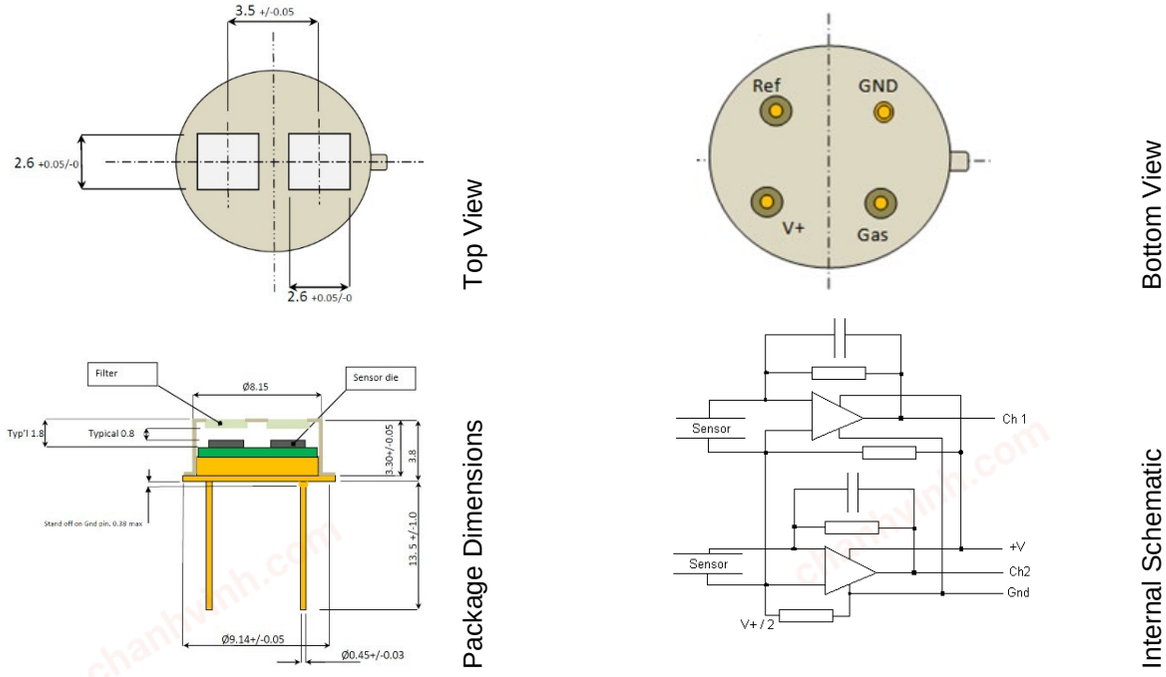




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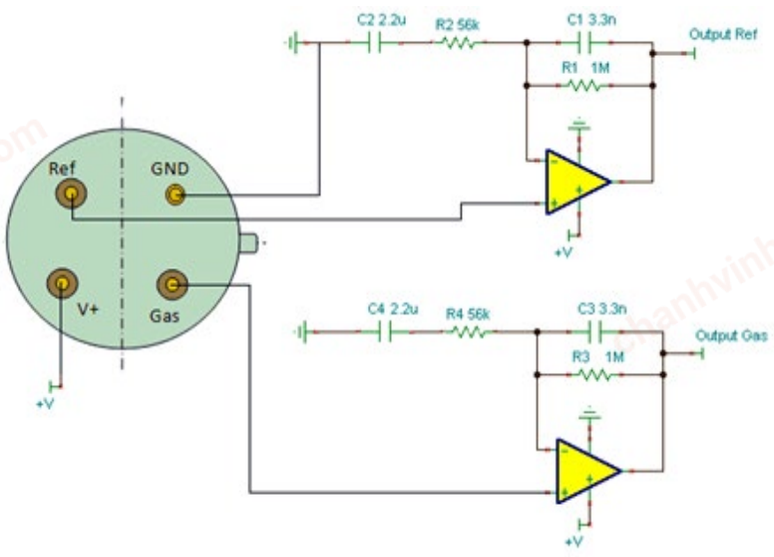
Package Information

Filter Window Size



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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Broadcom has a range of standard filters available.

Part Number	Channel 1		Channel 2 (Tab)	
	CWL µm / HPB nm	Use	CWL µm / HPB nm	Use
AFBR-S6PY2486	3.91 / 90	Reference	3.33 / 160	H-C
AFBR-S6PY0234	3.91 / 90	Reference	4.26 / 180	CO_2
AFBR-S6PY2343	3.70 / 110	Reference	4.26 / 180	CO_2 (Medical)
AFBR-S6PY2572	4.90 / 130	Reference	4.26 / 180	CO_2 (Medical)
AFBR-S6PY1943	3.91 / 90	Reference	4.30 / 110	CO_2 (Narrow)

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

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AFBR-S6ATO2-DS100