

# 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.

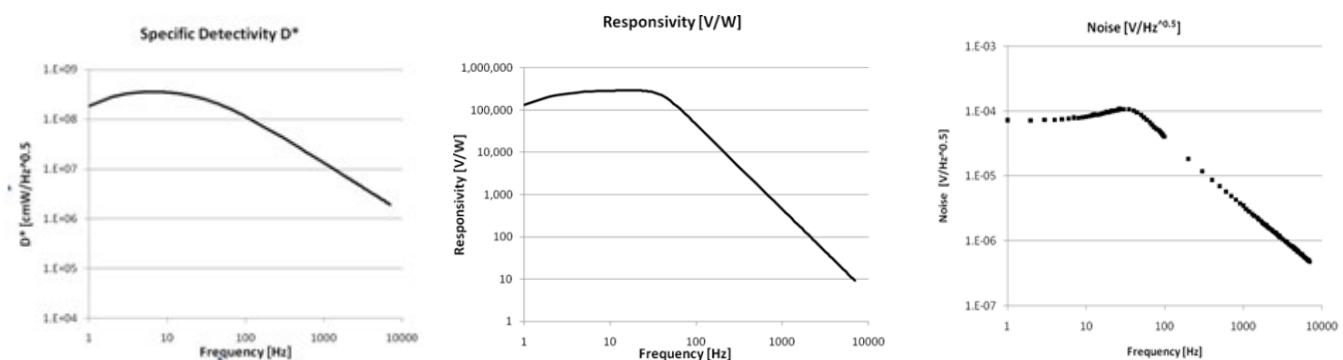


Sensor Characteristics		Electrical Characteristics	
Filter aperture	2.6 mm square	Max. Voltage (+V) <sup>2</sup>	8.0 V
Element size	1000 μm x 1000 μm	Min. Voltage	2.7 V
Package	TO39	Output voltage normalized around mid-rail	
Responsivity <sup>1</sup>	150,000 V/W	Microphonics	$S_{vib} \sim 2 \mu V/g$ at 10 Hz
D* <sup>1</sup>	$3.5 \times 10^8 \text{ cm} \sqrt{\text{Hz}}/\text{W}$	Time Constant	~12 ms
Noise <sup>1</sup>	70 $\mu V/\sqrt{\text{Hz}}$	Operating Temperature	-40 to +85 °C
		Storage Temperature	-40 to +110 °C
		Filters	See "Filters Available"

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

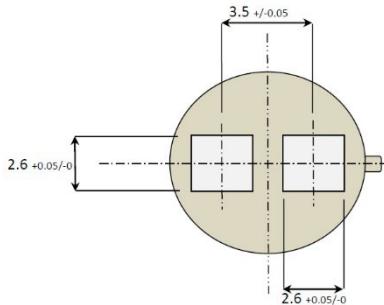
<sup>2</sup>Absolute maximum operating voltage

## Frequency Characteristics

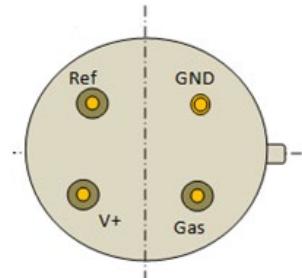


## Package Information

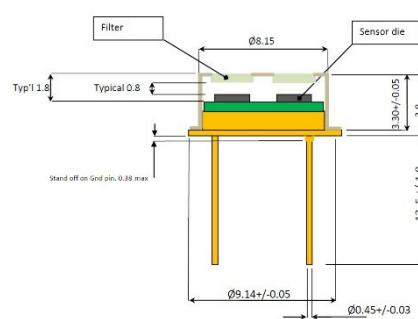
Filter Window Size



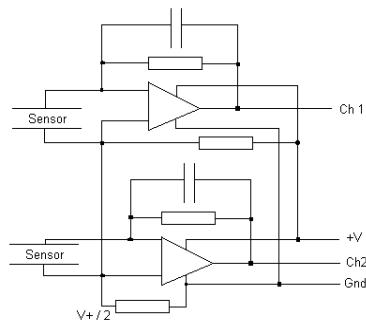
Top View



Bottom View



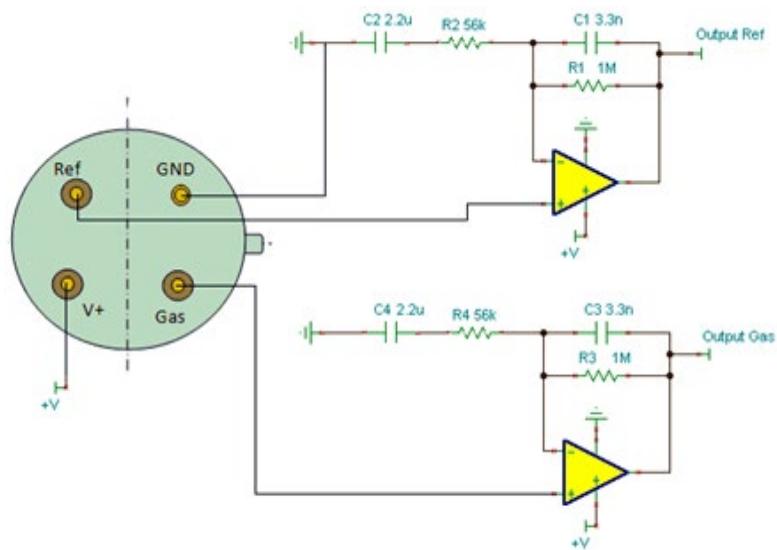
Package Dimensions



Internal Schematic

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

## Recommended Circuit Diagram



Broadcom has a range of standard filters available.

<b>Part Number</b>	<b>Channel 1</b>		<b>Channel 2 (Tab)</b>	
	CWL $\mu$ m / HPB nm	Use	CWL $\mu$ m / HPB nm	Use
<b>AFBR-S6PY2486</b>	3.91 / 90	Reference	3.33 / 160	H-C
<b>AFBR-S6PY0234</b>	3.91 / 90	Reference	4.26 / 180	CO <sub>2</sub>
<b>AFBR-S6PY2343</b>	3.70 / 110	Reference	4.26 / 180	CO <sub>2</sub> (Medical)
<b>AFBR-S6PY2572</b>	4.90 / 130	Reference	4.26 / 180	CO <sub>2</sub> (Medical)
<b>AFBR-S6PY1943</b>	3.91 / 90	Reference	4.30 / 110	CO <sub>2</sub> (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

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