Thin Film Pyroelectric Single Channel Sensor

Introduction

Broadcom thin film pyroelectric infrared (IR) sensors for gas detection and 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 element is built into a low noise circuit that has an internal CMOS operational amplifier, with a 10 GΩ feedback resistor outputting a voltage signal centred around half the supply rail.

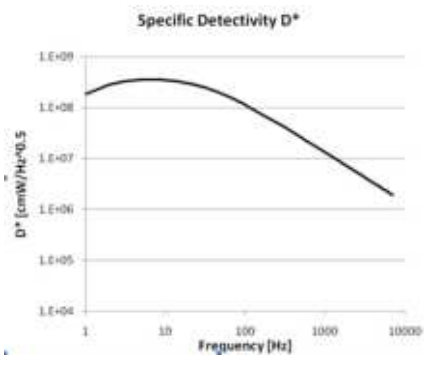


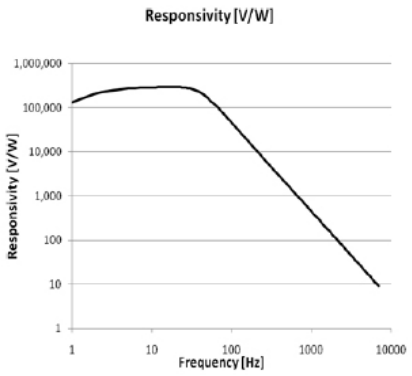
Sensor Characteristics	
Filter aperture	2.5 mm ø
Element size	1000 µm x 1000 µm
Package	TO39
Responsivity [1]	150,000 V/W
D* [1]	3.5 x 10^8 cm√Hz/ W
Noise [1]	70 µV√Hz
Op amp with 10 GΩ feedback resistor	

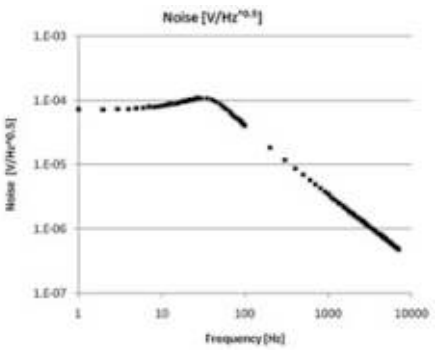
Electrical Characteristics	
Max. Voltage (+V) [2]	8.0 V
Output voltage normalised around mid-rail	
Min. Voltage (+V)	2.7 V
Microphonics	S_{vib}~2 µV/ g at 10 Hz
Time Constant	~12 ms
Operating Temperature	-40 to +85 °C
Storage Temperature	-40 to +110 °C
Filter	See "Filters Available"

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

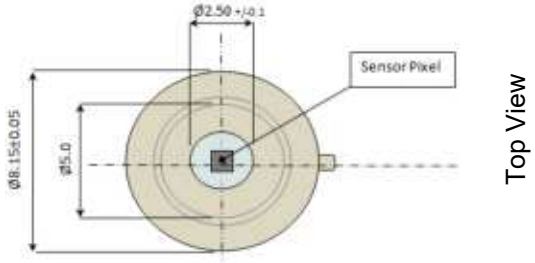
Frequency Characteristics



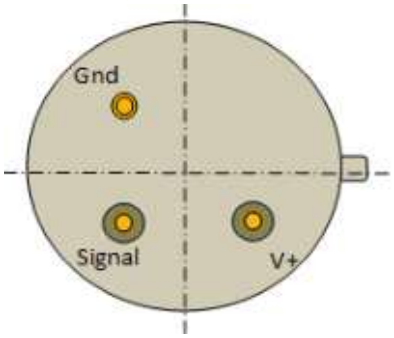




Package Information

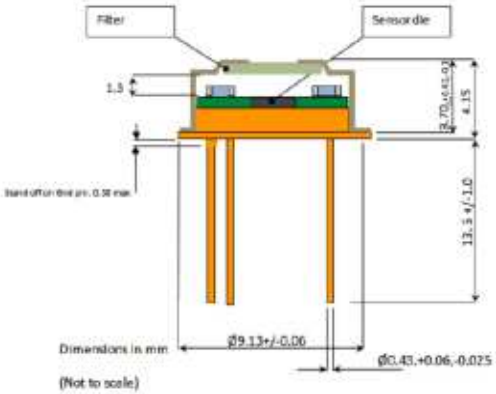


Top View

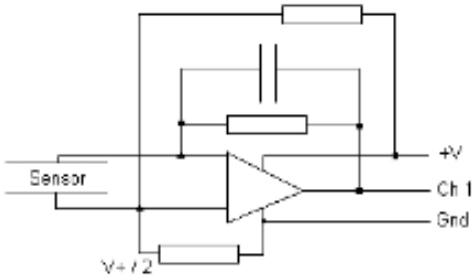


Bottom View

Filter window size



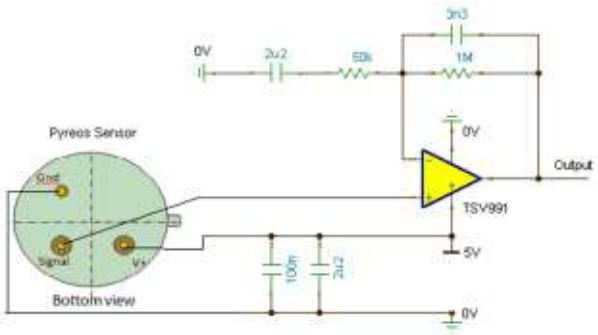
Package dimensions



Internal Schematic

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

Recommended Circuit Diagram



Example schematic

Filters Available

Broadcom has the following standard filters available.

Part number	Channel 1 **CWL µm / (HPB nm)**	Use
AFBR-S6PY0211	4.64 / (180)	CO

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

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