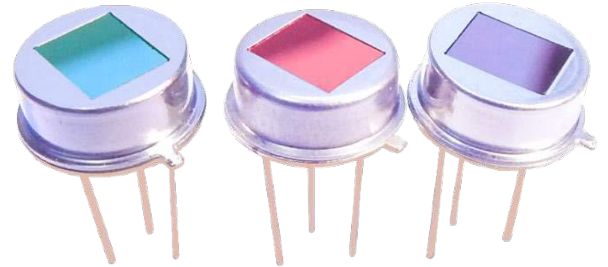


# Thin Film Pyroelectric Flame Sensor

## Introduction

Broadcom<sup>®</sup> thin film pyroelectric infrared flame detectors offer exceptionally high responsivity, a wide field of view of typically 100° (\*subject to filter band pass specification) and class leading rapid recovery from thermal and electrical shocks (typically <1 second downtime). This current mode sensor has excellent signal to noise at the signature 8-10 Hz flicker range of a flame, and can provide accurate discrimination of flame sources in triple IR flame detection systems. The sensor element is built into a low noise circuit that has an internal CMOS op amp with a 10GΩ feedback resistor outputting a voltage signal centred around half the supply rail.



### Sensor Characteristics

Filter aperture	5.2 mm x 4.2 mm
Element size	1000 μm x 1000 μm
Package	TO39
Responsivity <sup>1</sup>	150,000 V/W
D* <sup>1</sup>	3.5 x 10 <sup>8</sup> cm√Hz/ W
Noise <sup>1</sup>	Mean 70 μV/√Hz
Field of View	Typical 100° <sup>2</sup>

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

<sup>2</sup>With reference to filter used in AFBR-S6PY0573

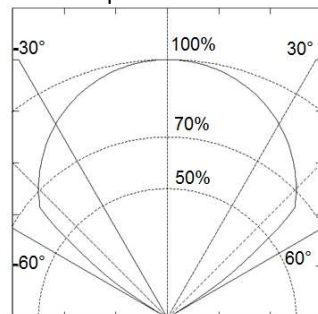
<sup>3</sup>Absolute maximum operating voltage

### Electrical Characteristics

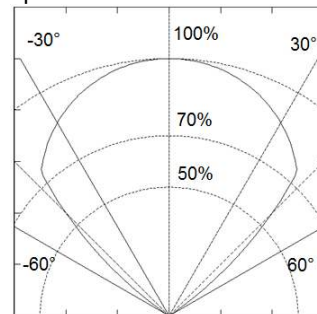
Max. Voltage (+V) <sup>3</sup>	8.0 V
Min. Voltage (+V)	2.7 V
Output voltage normalised around mid-rail	
Microphonics	S <sub>vib</sub> ~2 μV/√Hz at 10 Hz
Time Constant	~12 ms
Operating Temperature	-40 to +85 °C
Storage Temperature	-40 to +110 °C
Op-Amp with 10 GΩ feedback resistor	
Filter	As per Filters Available table

## Frequency Characteristics

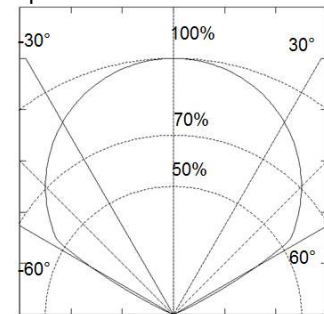
For V across horizontal window aperture



For V across vertical window aperture

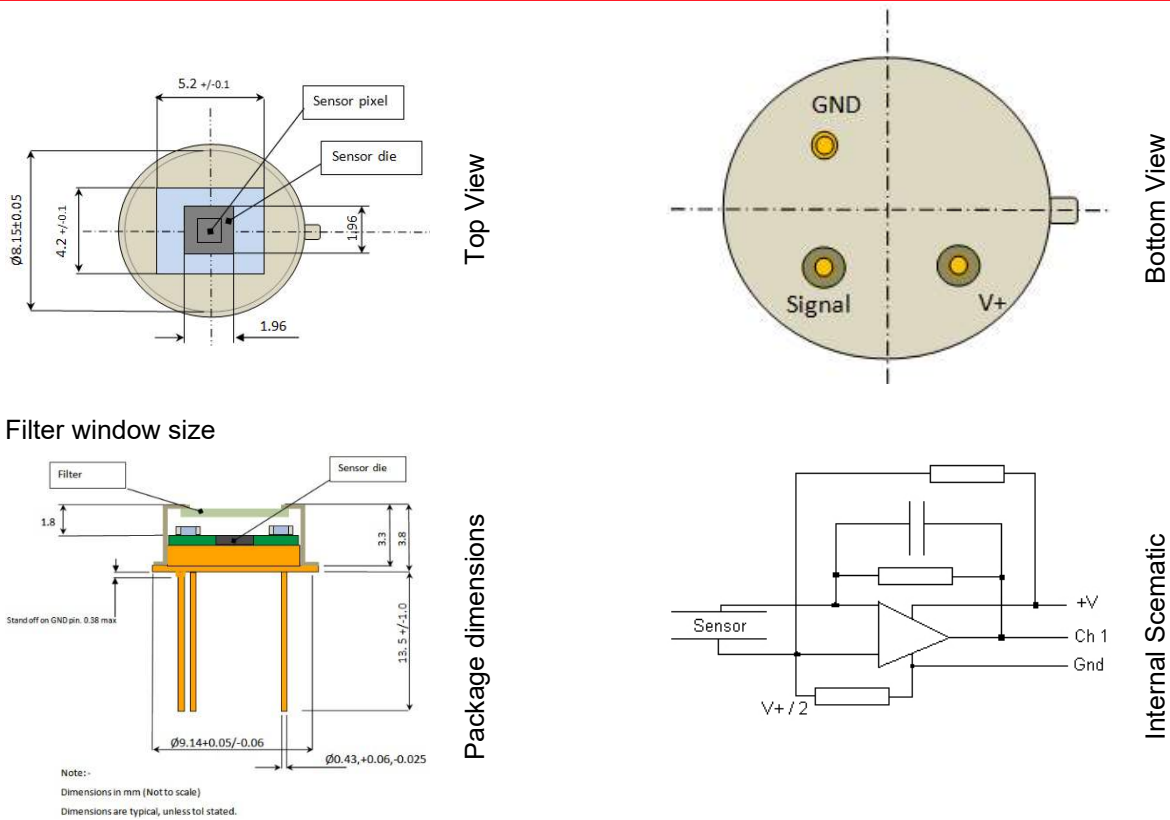


For V across diagonal window aperture



Note: Normalised polar plots show max FoV achievable along x,y axis and diagonal without any filter applied.

## Package Information



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

## Filters Available

Part number	AFBR-S6PY3200	AFBR-S6PY0575	AFBR-S6PY0573	AFBR-S6PY0574	AFBR-S6PY2341	AFBR-S6PY1601
Filter name	2.77 $\mu\text{m}$ bandpass	3.91 $\mu\text{m}$ bandpass	4.35 $\mu\text{m}$ bandpass	4.55 $\mu\text{m}$ bandpass	4.64 $\mu\text{m}$ bandpass	5.0 $\mu\text{m}$ cut on
Cut on wavelength typical ( $\mu\text{m}$ )	2.425	3.865	4.05	4.34	4.55	5.0
Cut off wavelength typical ( $\mu\text{m}$ )	3.115	3.955	4.65	4.76	4.73	—

Note: An additional window is required to provide high wavelength blocking (above 8.0  $\mu\text{m}$ ) and thermal shielding.

Search terms: current mode, voltage mode, infrared detector, infrared sensor, MIR, mid-IR, thermopile, photodiode

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