

# Thin Film Pyroelectric Flame Sensor

## Introduction

The Pyreos thin film pyroelectric 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 (<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

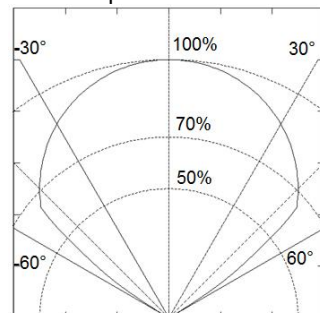
<sup>2</sup>With reference to filter used in PY0573

### Electrical Characteristics

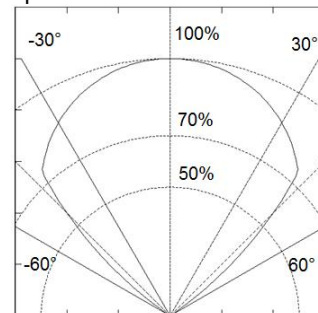
Max. Voltage (+V)	8.0 V
Min. Voltage (+V)	2.7 V
Output voltage normalised around mid-rail	
Microphonics	S <sub>vib</sub> ~2 μV/√Hz at 10 Hz
Time Constant	~12 ms
Operating Temperature	-40 to +85 °C
Storage Temperature	-40 to +110 °C
Op-Amp with 10 GΩ feedback resistor	
Filter	As per Filters Available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

## Frequency Characteristics

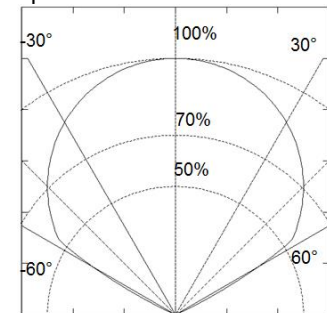
For V across horizontal window aperture



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.

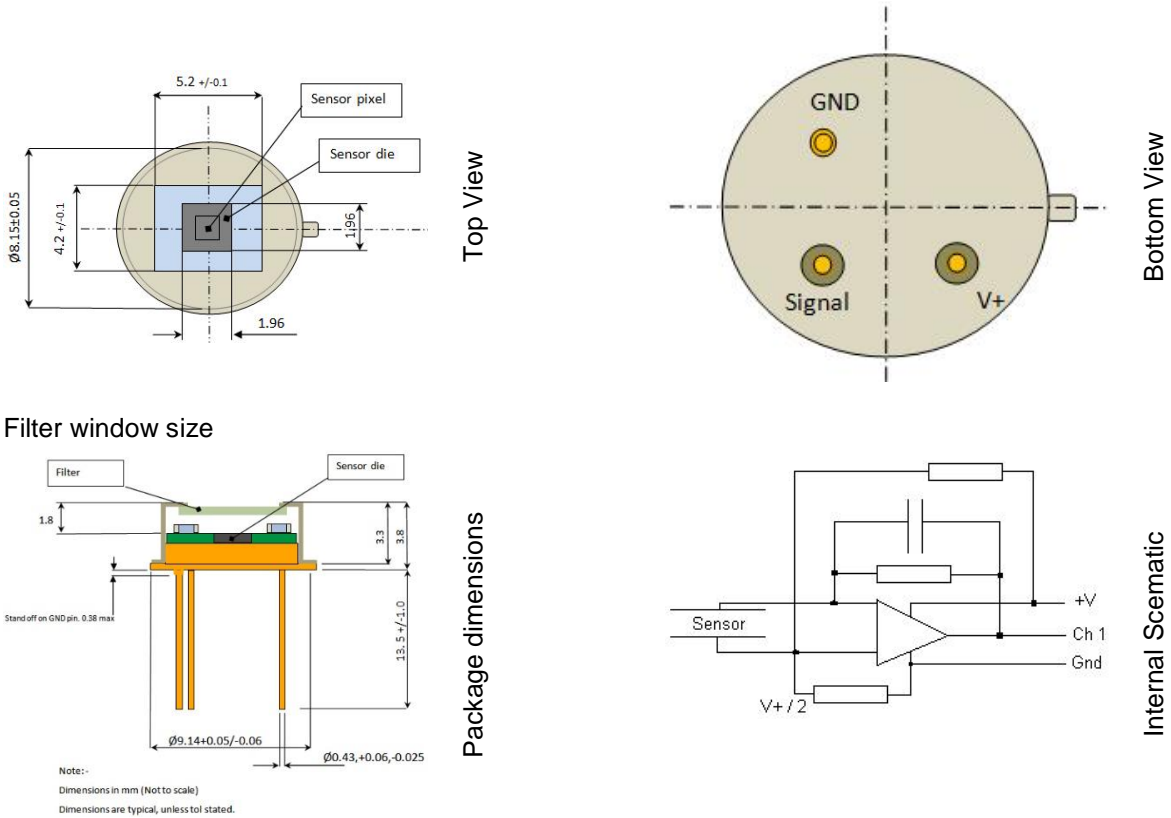
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**Order Information**

Please quote PY-ITV-FLAME-TO39(2+1) and your desired filter combination or quote specific part number PYXXXX as per filter table.

Contact: [sales@pyreos.com](mailto:sales@pyreos.com)

**Package Information**



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

**Filters Available**

Part number	PY1580	PY0575	PY0573	PY1600	PY0574	PY1601	PY0576
Filter name	3.38 $\mu$ m bandpass	3.91 $\mu$ m bandpass	4.35 $\mu$ m bandpass	4.48 $\mu$ m bandpass	4.55 $\mu$ m band pass	5.0 $\mu$ m cut on	5.5 $\mu$ m cut on
Cut on wavelength typical ( $\mu$ m)	3.295	3.865	4.05	4.17	4.34	5.0	5.5
Cut off wavelength typical ( $\mu$ m)	3.475	3.955	4.65	4.79	4.76	-	-

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

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