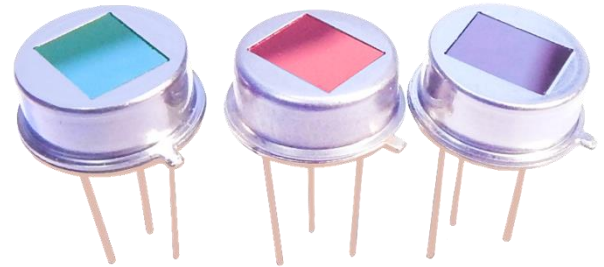


# Thin Film Pyroelectric Flame Sensor

## Introduction

The Pyreos 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 (<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

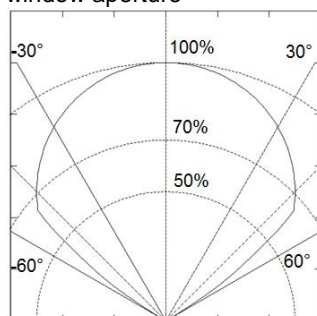
<sup>3</sup>Absolute maximum operating voltage

### Electrical Characteristics

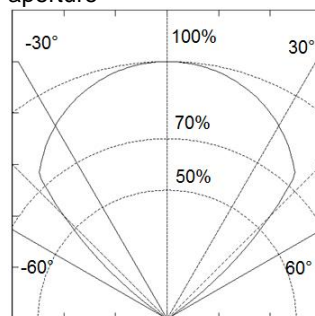
|   |                                     |
|---|-------------------------------------|
| Max. Voltage (+V) <sup>3</sup>            | 8.0 V                               |
| Min. Voltage (+V)                         | 2.7 V                               |
| Output voltage normalised around mid-rail |                                     |
| 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

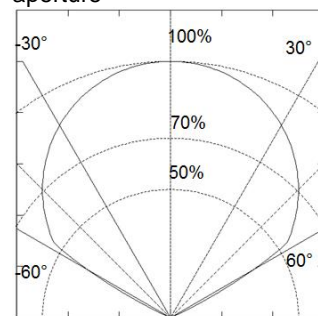
For V across horizontal window aperture



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.

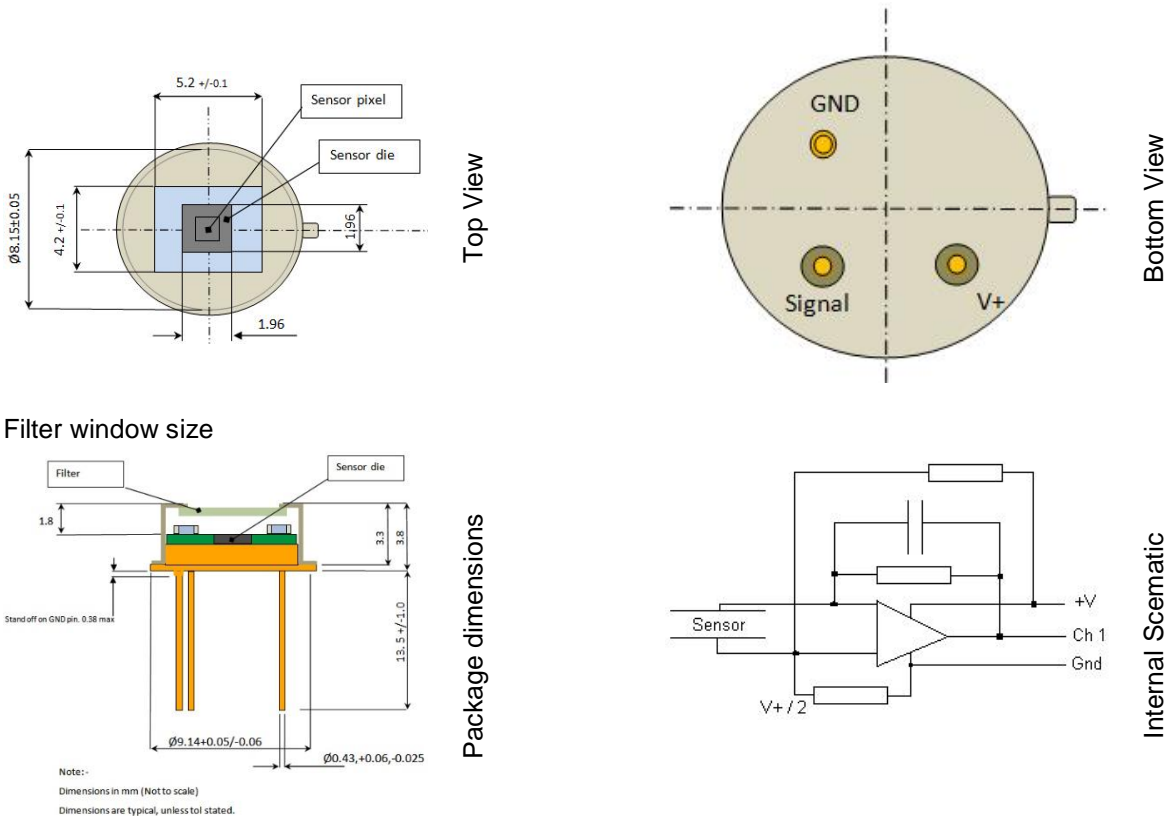
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**Order Information**

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.

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

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