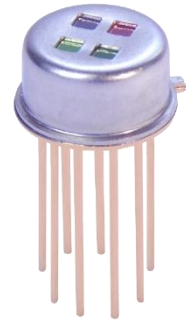


# Miniature Thin Film Four Channel Pyroelectric Sensor

## Introduction

Unlike other pyroelectric materials, the Pyreos thin film pyroelectric sensors can be reduced in physical size and still provide high sensitivity with fast frequency operation, enabling this highly stable four element sensor in a TO39 package. This current mode sensor offers performance in a small footprint and up to 100 Hz data monitoring. The sensor has internal CMOS trans impedance amplifiers, with 10 G $\Omega$  feedback resistors outputting voltage signals centred around half the supply rail. A range of IR filters are available.



### Sensor Characteristics

|                                             |                                                       |
|---------------------------------------------|-------------------------------------------------------|
| Filter aperture                             | 1.4 mm x 1.4mm                                        |
| Element size                                | 700 $\mu\text{m}$ x 325 $\mu\text{m}$                 |
| Package                                     | TO39                                                  |
| Responsivity <sup>1</sup>                   | 100,000 V/W                                           |
| D* <sup>1</sup>                             | $1.5 \times 10^8 \text{ cm}\sqrt{\text{Hz}}/\text{W}$ |
| Noise <sup>1</sup>                          | 40 $\mu\text{V}/\sqrt{\text{Hz}}$                     |
| Op amp with 10 G $\Omega$ feedback resistor |                                                       |

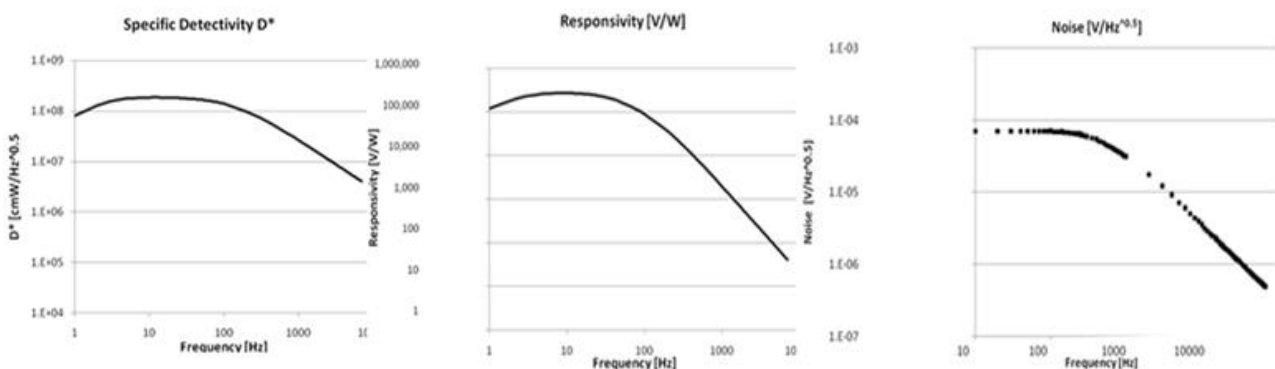
### Electrical Characteristics

|                       |                                                     |
|-----------------------|-----------------------------------------------------|
| Max. Voltage (+V)     | 5.0 V <sup>2</sup>                                  |
| Min. Voltage (+V)     | 2.7 V <sup>2</sup>                                  |
| Recommended Offset V  | (+V / 2) <sup>2</sup>                               |
| Microphonics          | S <sub>vib</sub> ~ 1 $\mu\text{V}/\text{g}$ at 10Hz |
| Time Constant         | ~10 ms                                              |
| Operating Temperature | -40 to +85 °C                                       |
| Storage Temperature   | -40 to +110 °C                                      |
| Offset V max          | (+V) – 0.1 V <sup>2</sup>                           |
| Offset V min          | 0.1 V <sup>2</sup>                                  |

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

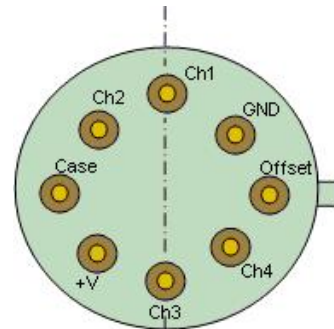
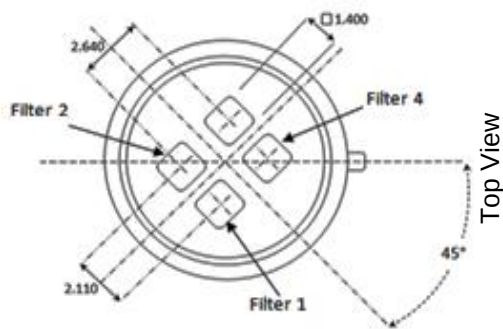
<sup>2</sup>With reference to GND

## Frequency Characteristics



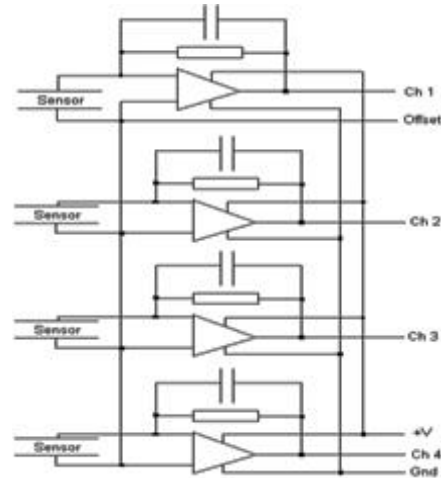
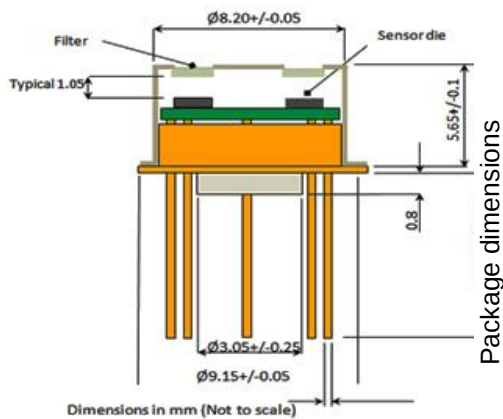
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## Package Information



Bottom View

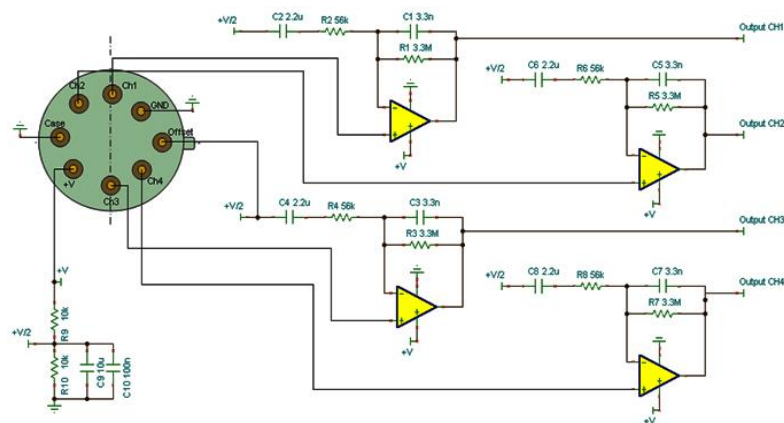
Filter window size



Internal Schematic

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

## Recommended Circuit Diagram



## Recommended Circuit Diagram

Pyreos has a range of standard filters available.

| Part number   | Channel 1<br>CWL $\mu\text{m}$ /<br>(HPB nm) | Channel 2<br>CWL $\mu\text{m}$ /<br>(HPB nm) | Channel 3<br>CWL $\mu\text{m}$ /<br>(HPB nm) | Channel 4<br>CWL $\mu\text{m}$ /<br>(HPB nm) | Use                       |
|---------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|---------------------------|
| <b>PY0235</b> | 4.26 / (180)                                 | 4.64 / (180)                                 | 3.30 / (160)                                 | 3.91 / (90)                                  | Exhaust,<br>environmental |
| <b>PY2213</b> | 3.90 / (200)                                 | 3.90 / (200)                                 | 4.26 / (180)                                 | 8.416 / (180)                                | Anaesthesia (1)           |
| <b>PY2435</b> | 8.75 / (200)                                 | 9.62 / (230)                                 | 12.25 / (210)                                | 8.55 / (180)                                 | Anaesthesia (2)           |

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

## Order Information

Please quote PY-I-QUAD-TO39(7+1) and your desired filter combination or quote specific part number PYXXXX as per filter table. Contact: [sales@pyreos.com](mailto:sales@pyreos.com)

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