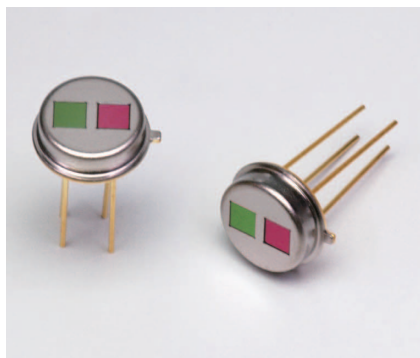


# Thermopile detector



T11722-01

## For CO<sub>2</sub> concentration measurement, High sensitivity

The T11722-01 is a dual-element type thermopile detector designed to detect CO<sub>2</sub> concentration with high accuracy. It consists of a high sensitivity dual-element thermopile detector and two band-pass filters for sensing two wavelengths (reference: 3.9 μm, CO<sub>2</sub>: 4.3 μm) simultaneously.

### Features

- **2 wavelengths detection**  
(Reference: 3.9 μm, CO<sub>2</sub>: 4.3 μm)
- **Metal package (TO-5)**
- **High sensitivity**

### Applications

- **CO<sub>2</sub> concentration measurement**

### Absolute maximum ratings

Parameter	Symbol	Value	Unit
Operating temperature	T <sub>opr</sub>	-30 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +125	°C

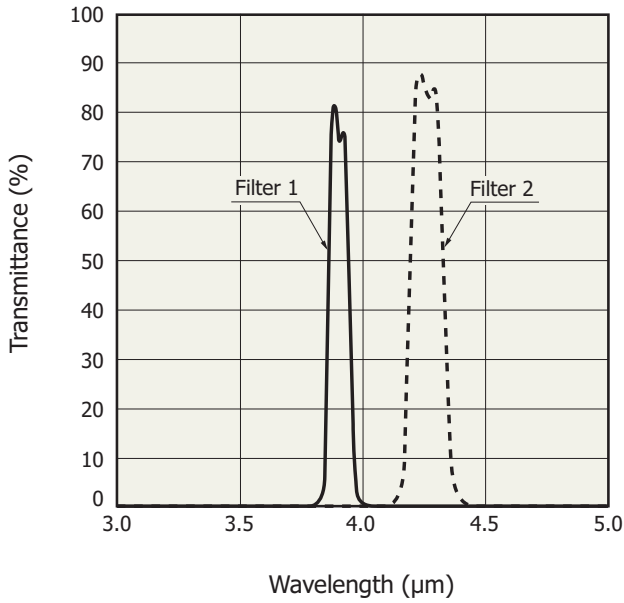
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

### Electrical and optical characteristics (T<sub>a</sub>=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photosensitive area (per 1 element)	-	Absorption layer size	-	1.2 × 1.2	-	mm
Spectral response range	λ	Band-pass filter, center wavelength (FWHM)	-	For reference: 3.9 (0.09) For CO <sub>2</sub> : 4.3 (0.14)	-	μm
Photosensitivity*1	S	1 Hz, 500 K	40	50	60	V/W
Element resistance	Re		100	125	150	kΩ
Noise voltage	V <sub>n</sub>	Johnson noise	-	45	50	nV/Hz <sup>1/2</sup>
Noise equivalent power*1	NEP		-	0.9	1.3	nW/Hz <sup>1/2</sup>
Detectivity*1	D*		0.9 × 10 <sup>8</sup>	1.3 × 10 <sup>8</sup>	-	cm·Hz <sup>1/2</sup> /W
Rise time	t <sub>r</sub>	0 to 63%	-	20	30	ms
Temperature coefficient of element resistance	TCR		-	±0.1	-	%/°C

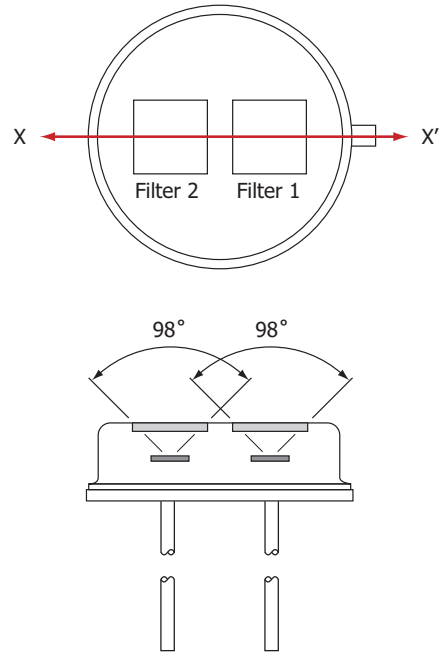
\*1: Without filter

**Spectral transmittance characteristics of window material (typical example)**



KIRD80508EA

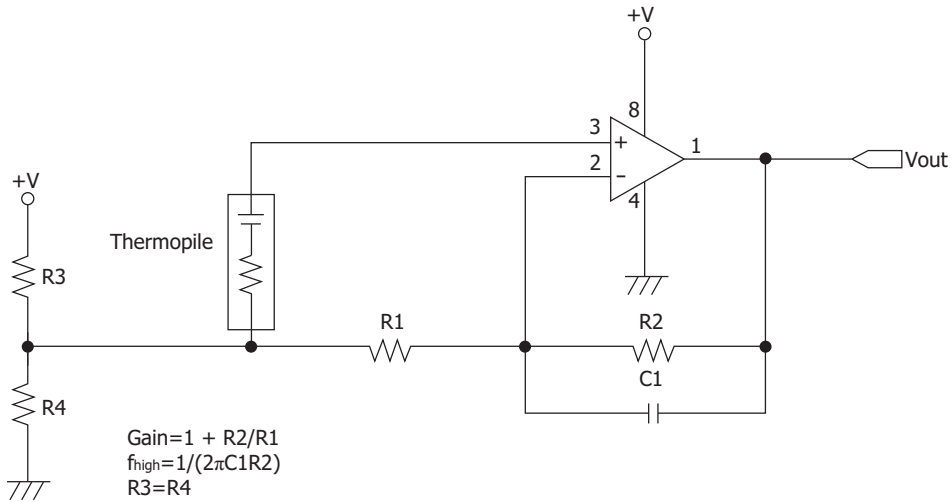
**Field of view**



KIRDC0103EA

**Operating circuits**

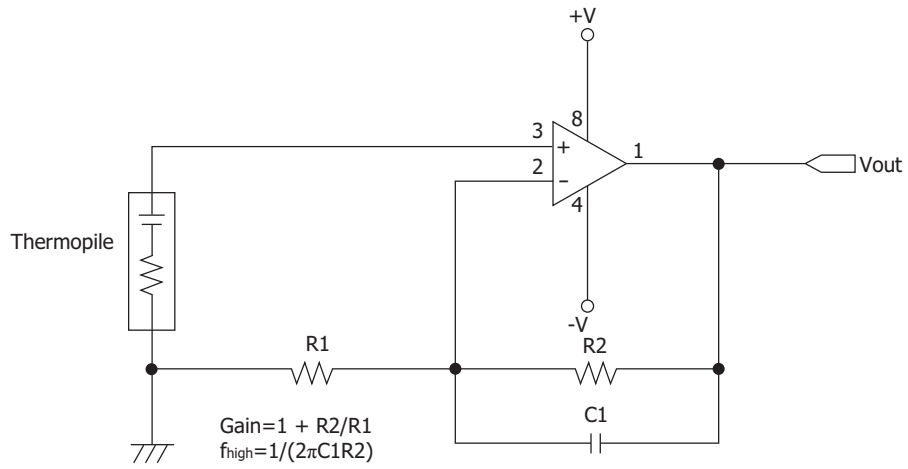
Single power supply type



Since the thermopile output signal is very low in the order of microvolts, use an amplifier with a low offset voltage. (Example: LTC1050)

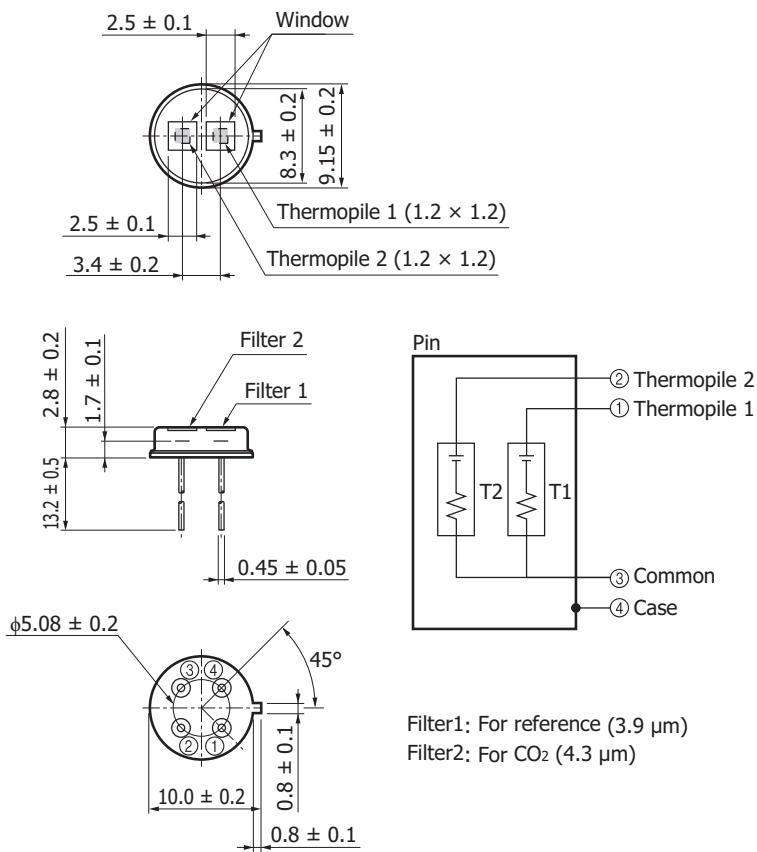
KIRDC0104EA

Dual power supply type



KIRDC0105EA

**Dimensional outline (unit: mm)**



KIRDA0222EB

## Precautions

The band-pass filters used in this product have a secondary transmission at wavelengths longer than 10  $\mu\text{m}$ . If the secondary transmission affects measurements, install a sapphire glass, etc. in front of the light input window to block long wavelength light.

## Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

### Precautions

- Disclaimer
- Metal, Ceramic, Plastic package products/Precautions

Information described in this material is current as of February 2017.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

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