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Thermopile detector

T11722-01

For CO_2 concentration measurement, High sensitivity

The T11722-01 is a dual-element type thermopile detector designed to detect CO_2 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_2: 4.3 µm) simultaneously.

Features

- **2 wavelengths detection (Reference: 3.9 µm, CO_2: 4.3 µm)**
- **Metal package (TO-5)**
- **High sensitivity**

Applications

- **CO_2 concentration measurement**

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Operating temperature	Topr	-30 to +85	°C
Storage temperature	Tstg	-40 to +125	°C

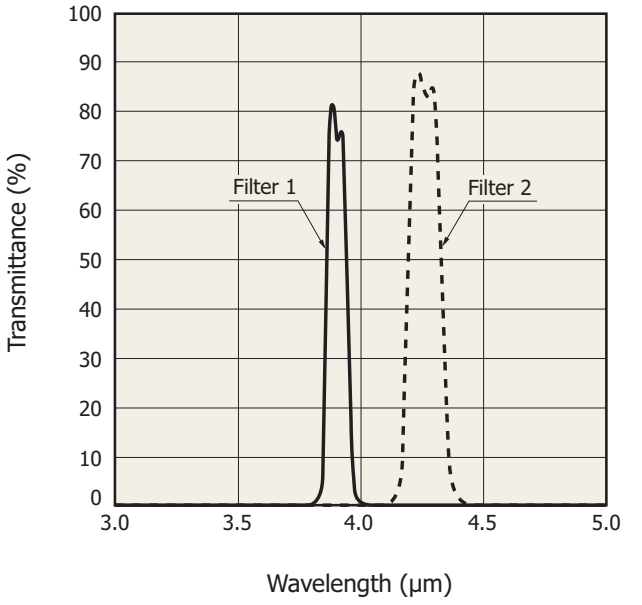
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characterisitics (Ta=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_2: 4.3 (0.14)	-	µm
Photosensitivity*1	S	1 Hz, 500 K	40	50	60	V/W
Element resistance	Rd		100	125	150	kΩ
Noise voltage	Vn	Johnson noise	-	45	50	$nV/Hz^{1/2}$
Noise equivalent power*1	NEP		-	0.9	1.3	$nW/Hz^{1/2}$
Detectivity*1	D*		0.9×10^8	1.3×10^8	-	$cm \cdot Hz^{1/2}/W$
Rise time	tr	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)



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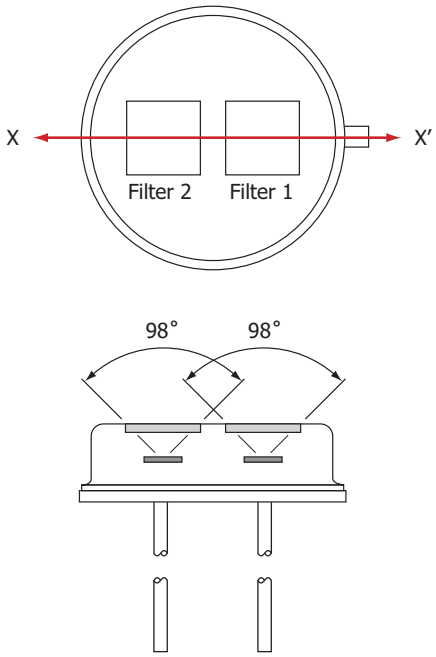
Field of view



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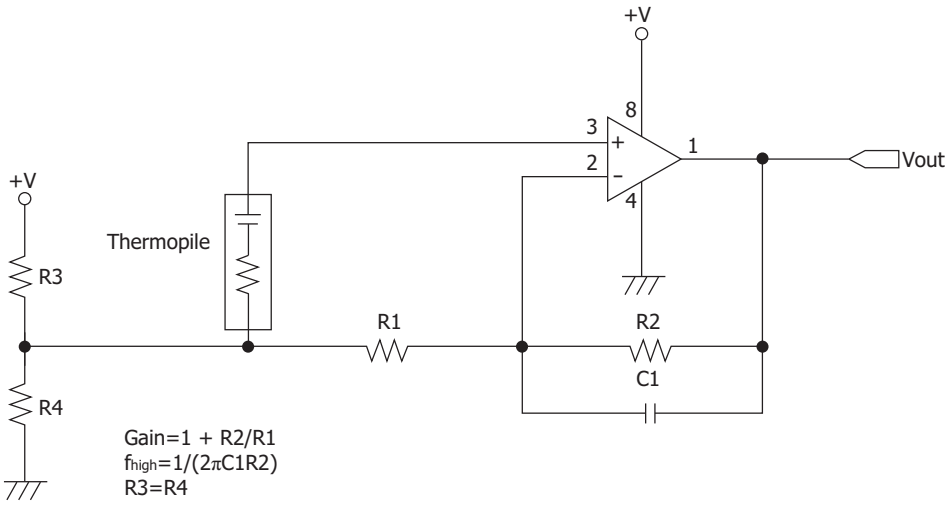
Operating circuits

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)

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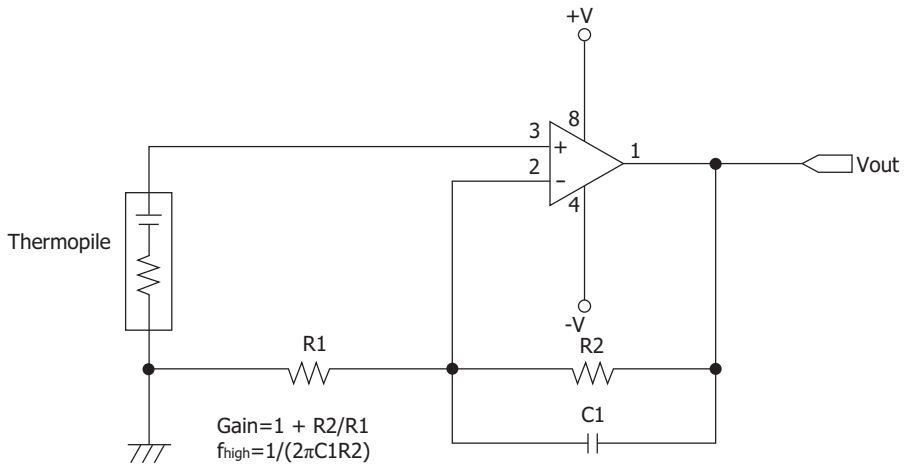
Dual power supply type



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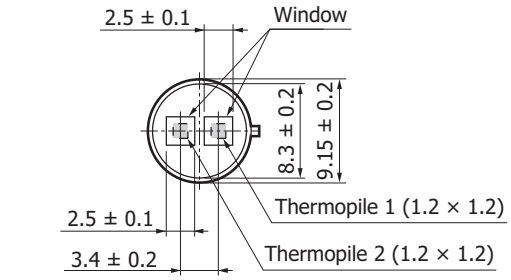
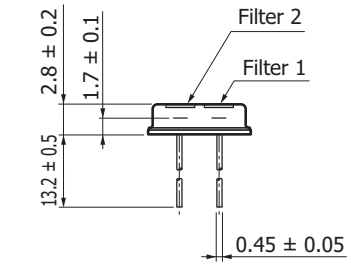
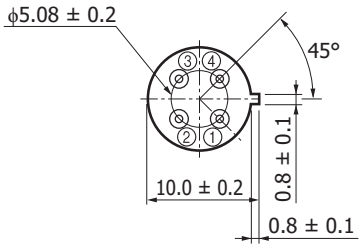
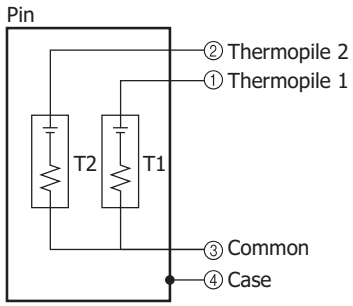
Dimensional outline (unit: mm)









Filter1: For reference (3.9 μm)
Filter2: For CO_2 (4.3 μm)

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Precautions

The band-pass filters used in this product have a secondary transmission at wavelengths longer than 10 µm. 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

■ Precautions

· Notice
· Metal, Ceramic, Plastic package products/Precautions

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Cat. No. KIRD1120E02 Oct. 2013 DN