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Thermopile detector

T15770

High sensitivity, for flame detection

The T15770 is a high-sensitivity thermopile detector suitable for flame detection. Infrared energy generated from flame has spectral characteristics of peak wavelength 4.45 µm. The light input window of the T15770 employs the band-pass filter which passes the light of this wavelength.

Features

- **Center sensitivity wavelength: 4.45 µm**
- **TO-18 package**
- **High sensitivity**

Applications

- **Flame detection**

Structure

Parameter	Symbol	Specification	Unit
Photosensitive area	A	1.2 × 1.2	mm
Package	-	TO-18	-
Window material	-	4.45 µm band-pass filter	-

Absolute maximum ratings

Parameter	Symbol	Value	Unit
Operating temperature*1	Topr	-30 to +85	°C
Storage temperature*1	Tstg	-40 to +125	°C

*1: No dew condensation
When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

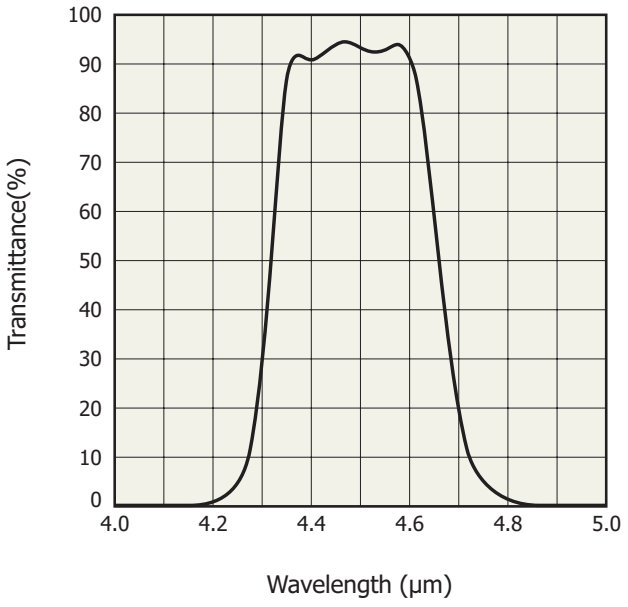
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Center sensitivity wavelength	λ		-	4.45	-	µm
Photosensitivity*2	S	1 Hz, 500 K	40	50	60	V/W
Element resistance	Re		100	125	150	kΩ
Noise voltage	Vn	Johnson noise	-	45	50	$nV/Hz^{1/2}$
Noise equivalent power*2	NEP		-	0.9	1.3	$nW/Hz^{1/2}$
Detectivity*2	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
Field of view	FOV	Photosensitivity 50%	-	90	-	degrees

*2: Without filter

Spectral transmittance characteristics of window material (typical example)



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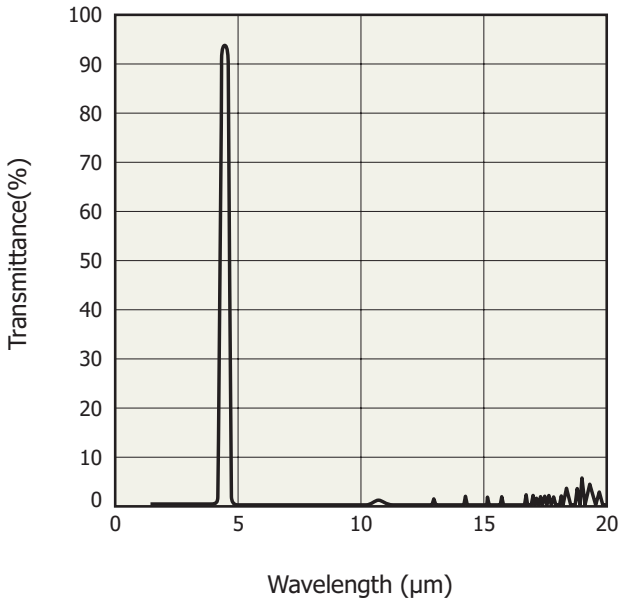

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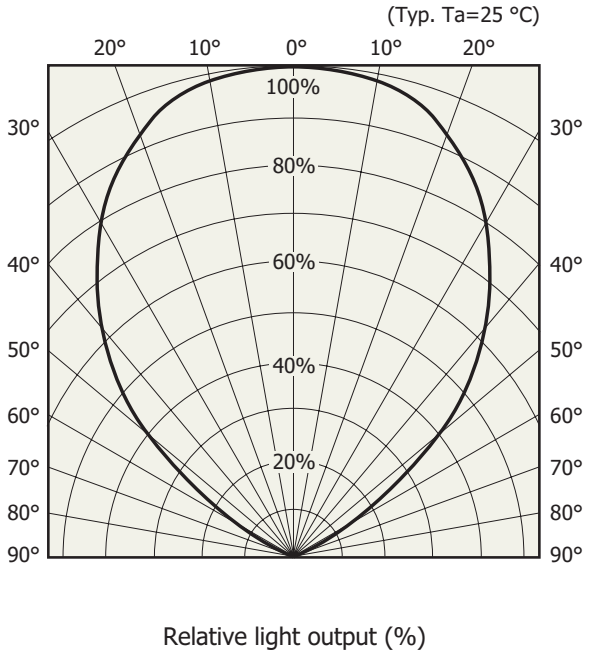
Directivity



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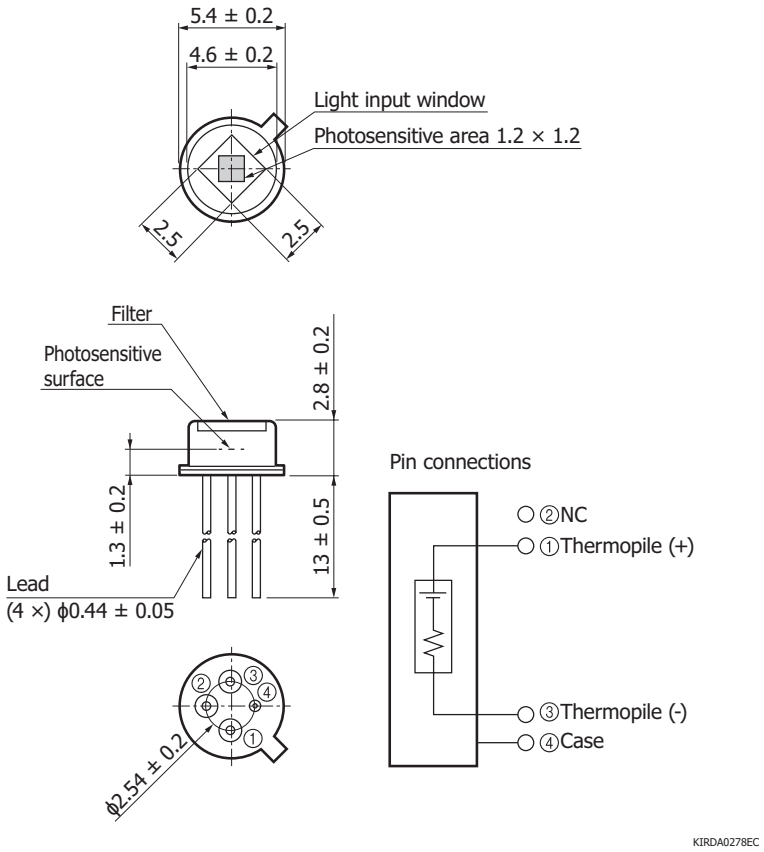
Dimensional outline (unit: mm)



Recommended soldering conditions

· Solder temperature: 260 °C max. (10 s or less, once)
Solder the leads at a point at least 1 mm away from the package body.
Note: When you set soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Precautions

The T15770 band-pass filter has a second order transmission at wavelength 10 µm or higher. If the effect of the second order transmission cannot be ignored, install a sapphire glass or the like in front of the light input window.

When the temperature of the thermopile detector changes rapidly, output changes greatly. Be careful during design so that element temperature does not change suddenly. We recommend you take the following steps to measure incident light level with high accuracy.
· Do not place an IC that has large current consumption near this product.
· Do not use a structure that makes this product directly contact the heating element.
· If necessary, enclose the product with a material that has high heat capacity, so that element temperature changes gradually.

Excessive light entering the thermopile can damage the photosensitive area. Depending on the operating conditions, injection of ϕ500 µm and 40 mW (approximately 200 mW/mm^2) of light into the photosensitive area may cause failure or degradation of characteristics.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions
· Disclaimer
· Metal, ceramic, plastic package products

■ Technical information
· Thermopile detectors

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