

## T11361 series

### High-sensitivity thermopile detectors with thermistor For gas density measurements

The T11361 series is a family of thermopile detectors equipped with an internal thermistor for compensating for output variations caused by changes in the ambient temperature. The T11361-01 is suited for gas density measurements or the like. It uses a TO-18 package with a window having high transmittance in the 3 to 5  $\mu\text{m}$  spectral band. By attaching an external band-pass filter to the thermopile detector, customers can apply it to various types of gas density measurements. The T11361-05 employs a 4.3  $\mu\text{m}$  band-pass filter and is suitable for CO<sub>2</sub> density measurements.

#### Features

- Spectral response: 3 to 5  $\mu\text{m}$  (T11361-01), 4.3  $\mu\text{m}$  (T11361-05)
- TO-18 package
- High sensitivity
- Built-in thermistor

#### Applications

- Gas density measurement and the like (T11361-01)
- CO<sub>2</sub> density measurement (T11361-05)

#### Absolute maximum ratings

Parameter	Symbol	T11361-01	T11361-05	Unit
Operating temperature	Topr	-30 to +85	-10 to +80	°C
Storage temperature	Tstg	-40 to +100	-20 to +85	°C
Thermistor power dissipation	Pth	0.2		mW

\*: 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 surface 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.

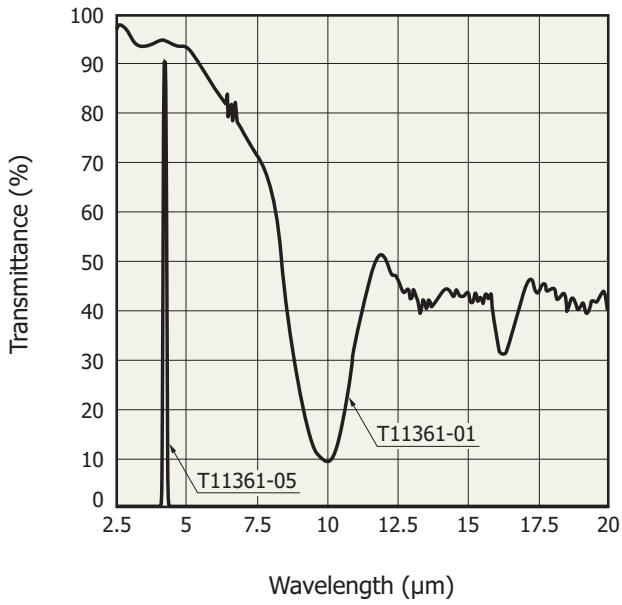
#### Structure

Parameter	Symbol	Condition	T11361-01	T11361-05	Unit
Photosensitive area	A		1.2 × 1.2		mm
Package	-		TO-18		-
Window material	-		AR coating Si with 3 to 5 $\mu\text{m}$ high-transmittance	4.3 $\mu\text{m}$ band-pass filter	-

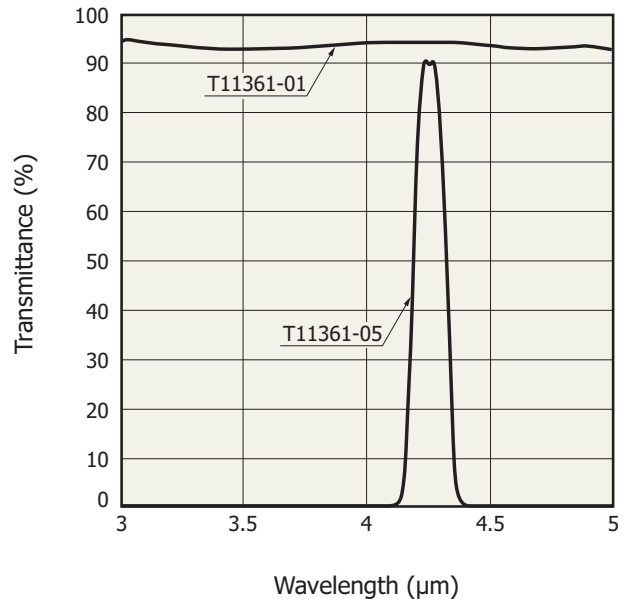
#### Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	T11361-01			T11361-05			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response	$\lambda$		-	3 to 5	-	-	4.3	-	$\mu\text{m}$
Photosensitivity	S	1 Hz, 500 K	40	50	60	40	50	60	V/W
Element resistance	Re		100	125	150	100	125	150	k $\Omega$
Noise voltage	Vn	Johnson noise	-	45	50	-	45	50	nV/Hz <sup>1/2</sup>
Noise equivalent power	NEP		-	0.9	1.3	-	0.9	1.3	nW/Hz <sup>1/2</sup>
Detectivity	D*		$0.9 \times 10^8$	$1.3 \times 10^8$	-	$0.9 \times 10^8$	$1.3 \times 10^8$	-	cm·Hz <sup>1/2</sup> /W
Rise time	tr	0 to 63%	-	20	30	-	20	30	ms
Temperature coefficient of element resistance	TCR		-	±0.1	-	-	±0.1	-	%/°C
Field of view	FOV	Photosensitivity 50%	-	90	-	-	90	-	degrees
Thermistor resistance	Rth		9	10	11	9	10	11	k $\Omega$
Constant B	B	25/75 °C	3800	3900	4000	3800	3900	4000	K

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

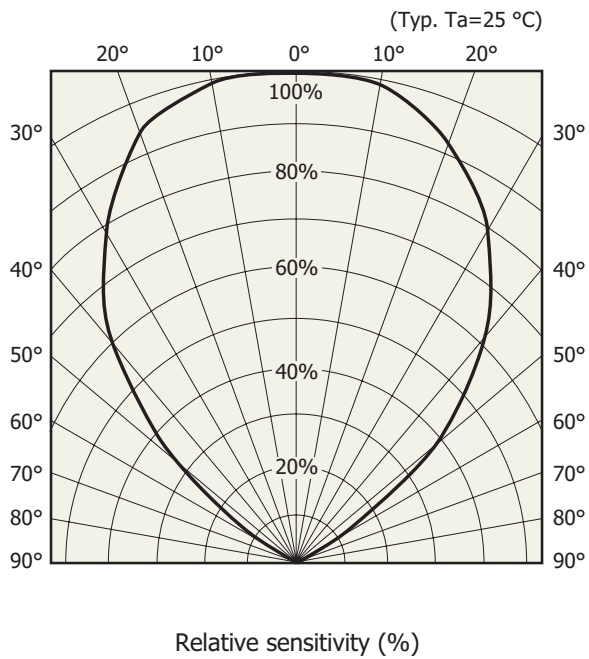


KIRDB0608EA



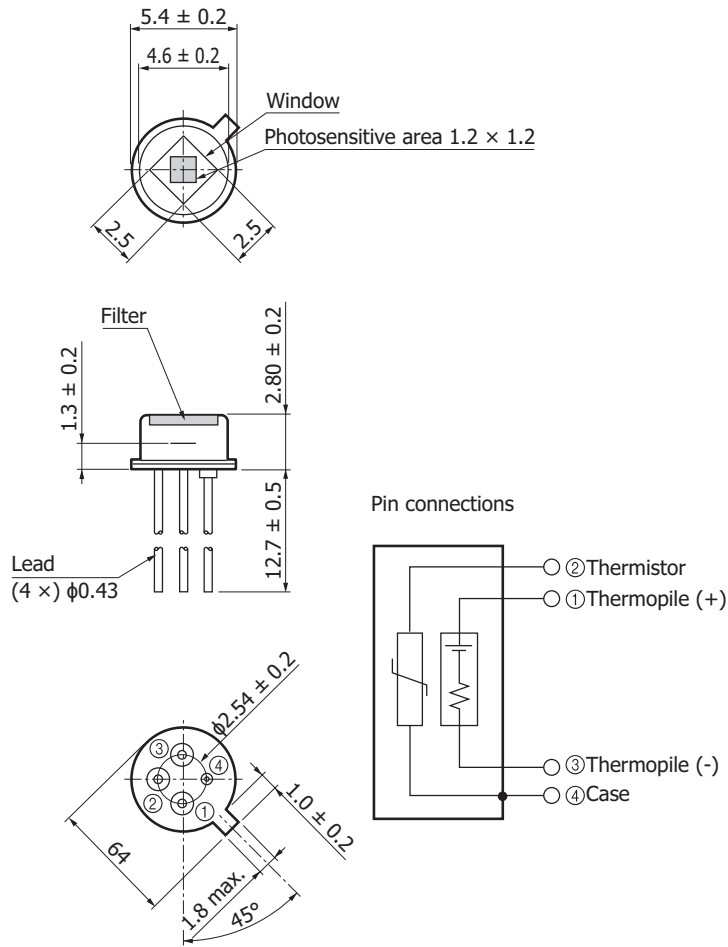
KIRDB0609EA

**Directivity**



KIRDB0451EA

Dimensional outline (unit: mm)



KIRD0240EA

### ❖ Recommended soldering condition

- 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 condition, check that problems do not occur in the product by testing out the condition in advance.

### ❖ Precautions (T11361-05)

The T11361-05 band-pass filter has a second order transmission at 10 μm or higher. If this causes an unwanted effect, install a sapphire glass or the like in front of the light input window to cut the long wavelengths.

### ❖ 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
- Technical information
  - Thermopile detectors / Technical note

Information described in this material is current as of March 2021.

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.

# HAMAMATSU

[www.hamamatsu.com](http://www.hamamatsu.com)

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81)53-434-3311, Fax: (81)53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218, E-mail: [usa@hamamatsu.com](mailto:usa@hamamatsu.com)

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8, E-mail: [info@hamamatsu.de](mailto:info@hamamatsu.de)

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10, E-mail: [infos@hamamatsu.fr](mailto:infos@hamamatsu.fr)

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777, E-mail: [info@hamamatsu.co.uk](mailto:info@hamamatsu.co.uk)

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: [info@hamamatsu.se](mailto:info@hamamatsu.se)

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: [info@hamamatsu.it](mailto:info@hamamatsu.it)

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866, E-mail: [hpc@hamamatsu.com.cn](mailto:hpc@hamamatsu.com.cn)

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081, E-mail: [info@hamamatsu.com.tw](mailto:info@hamamatsu.com.tw)