



S9674

## Applicable to lead-free solder reflow and wide temperature range

The S9674 is a photodiode that is applicable to lead-free solder reflow and has an extremely wide operating and storage temperature range (-40 to +125 °C). The small and thin leadless package allows reducing the mount area on a printed circuit board.

### Features

- Suitable for lead-free solder reflow
- Surface mount type, small and thin leadless package
- Operating/storage temperature: -40 to +125 °C
- Photosensitive area: 2 × 2 mm
- High sensitivity: 0.7 A/W ( $\lambda=960$  nm)

### Applications

- Rain sensor
- Sun sensor, etc.

### Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	$V_R$ max.	10	V
Operating temperature	$T_{opr}$	-40 to +125	°C
Storage temperature	$T_{stg}$	-40 to +125	°C
Reflow soldering condition*1	$T_{sol}$	Peak temperature 260 °C, two times (see page 5)	-

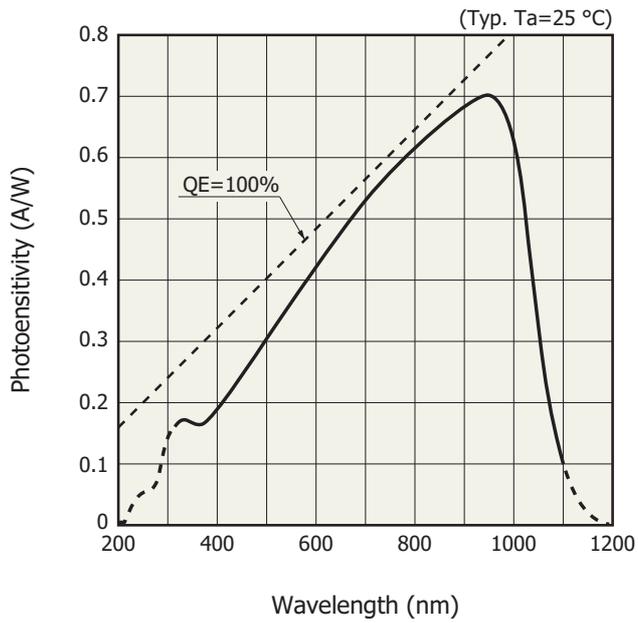
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

\*1: JEDEC level 4

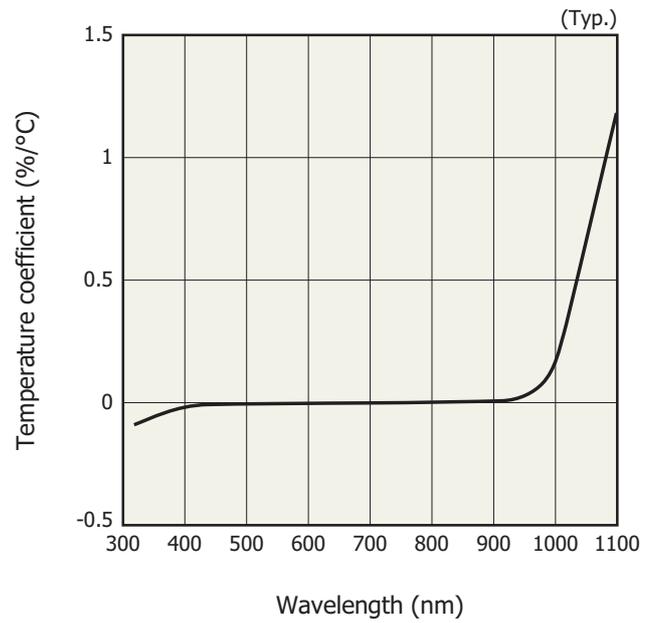
### Electrical and optical characteristics ( $T_a=25$ °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$		-	320 to 1100	-	nm
Peak sensitivity wavelength	$\lambda_p$		-	960	-	nm
Photo sensitivity	S	$\lambda=\lambda_p$	0.6	0.7	-	A/W
Short circuit current	$I_{sc}$	100 lx, 2856 K	-	4.8	-	$\mu$ A
Temperature coefficient of $I_{sc}$	-		-	+0.1	-	%/°C
Half-value angle	-		-	$\pm 60$	-	degree
Dark current	$I_D$	$V_R=5$ V	-	0.01	1	nA
Temperature coefficient of $I_D$	$T_{CID}$		-	1.12	-	times/°C
Rise time	$t_r$	$V_R=0$ V, $R_L=1$ k $\Omega$ 10 to 90%	-	2	-	$\mu$ s
Terminal capacitance	$C_t$	$V_R=0$ V, $f=10$ kHz	-	500	-	pF

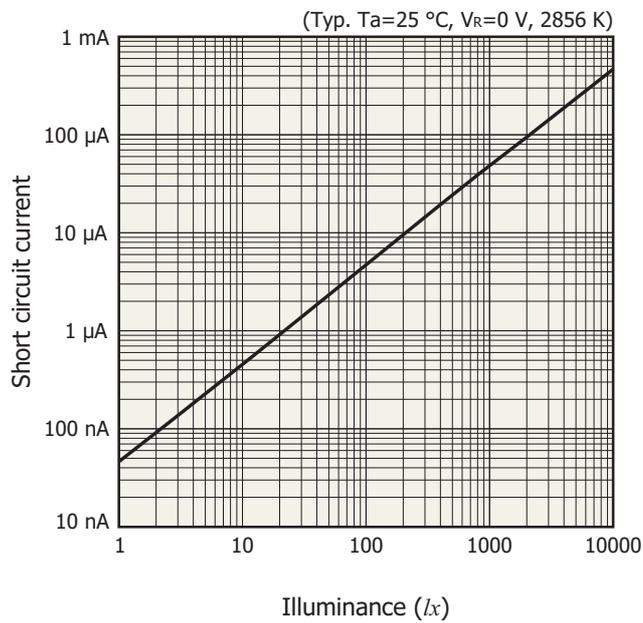
### Spectral response



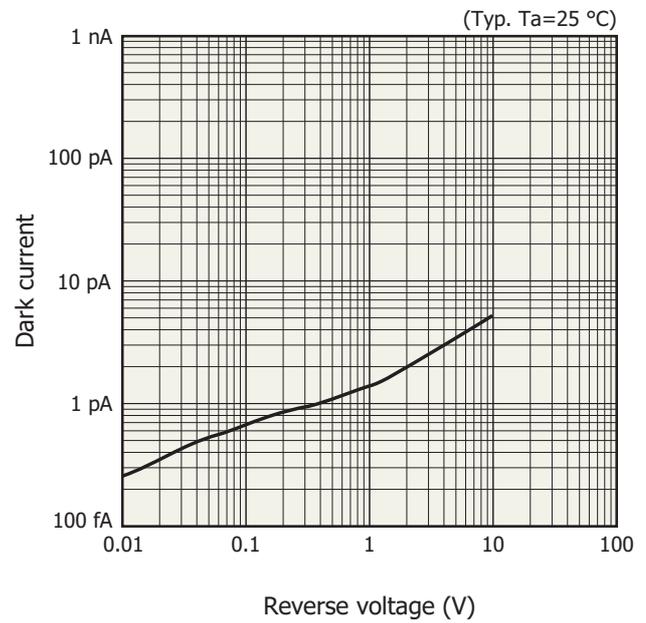
### Photosensitivity temperature characteristics



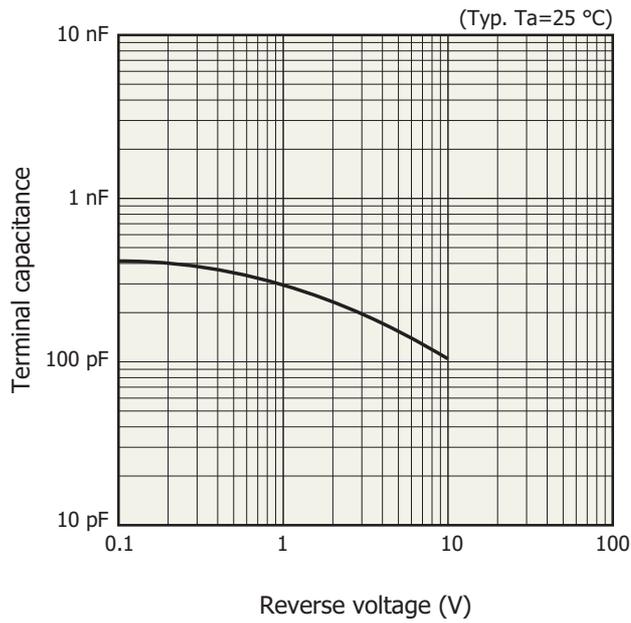
### Linearity



### Dark current vs. reverse voltage

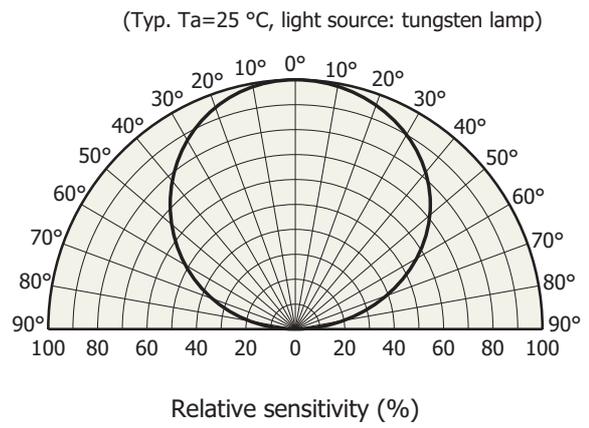


Terminal capacitance vs. reverse voltage



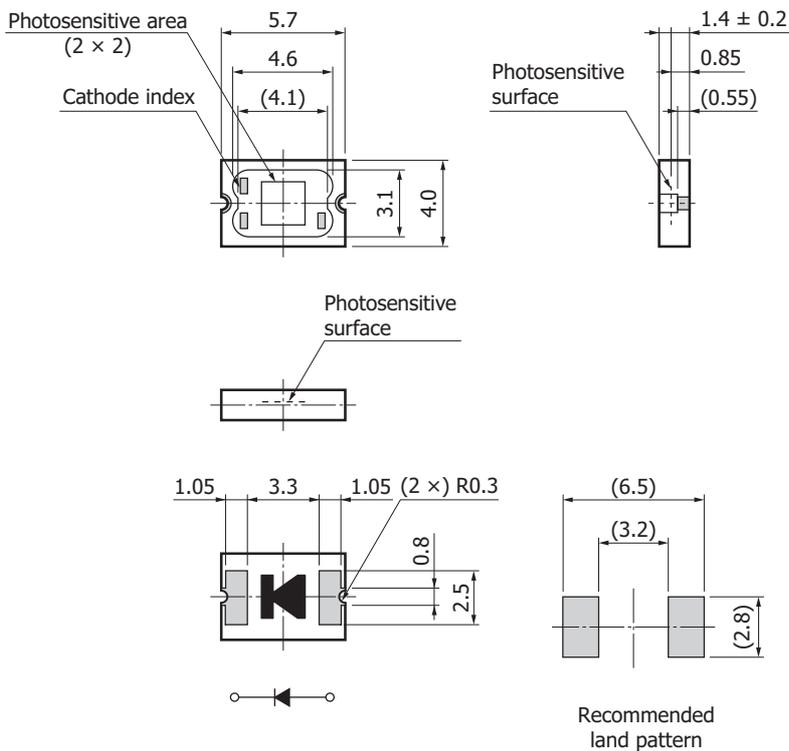
KSPDB0251EA

Directivity



KSPDB0249EA

Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ±0.15, ±2°

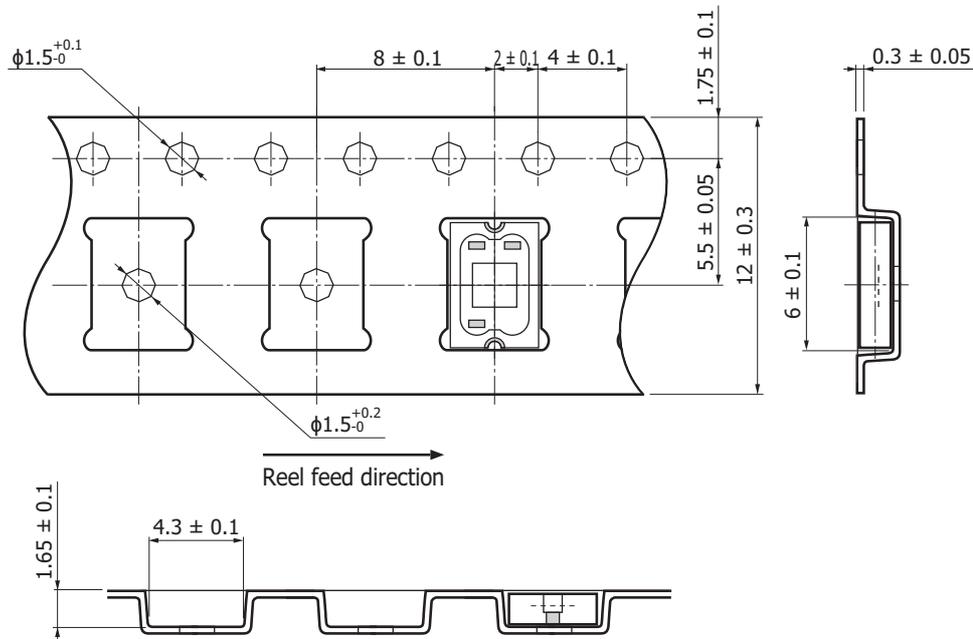
KSPDA0179EC

### Standard packing specifications

- Reel (conforms to JEITA ET-7200)

Dimensions	Hub diameter	Tape width	Material	Electrostatic characteristics
254 mm	100 mm	12 mm	Polystyrene	Conductive

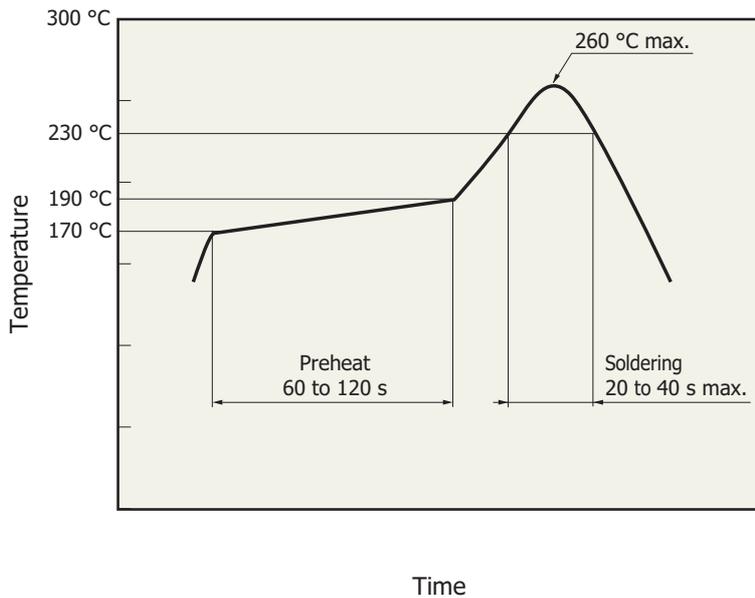
- Embossed tape (unit: mm, material: polystyrene, conductive)



KSPDC0088EA

- Packing quantity  
2000 pcs/reel
- Packing type  
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

### Measured example of temperature profile with our hot-air reflow oven for product testing



KPINB0385EB

- This product supports lead-free soldering. After unpacking, store it in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 72 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. Before actual reflow soldering, check for any problems by testing out the reflow soldering methods in advance.

### Related information

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

#### ■ Precautions

- Disclaimer
- Surface mount type products

#### ■ Technical information

- Si photodiode / Application circuit examples

Information described in this material is current as of July, 2015.

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

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8

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

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39) 02-93581733, Fax: (39) 02-93581741

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaiming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866

Cat. No. KSPD1070E05 Jul. 2015 DN