

S10355-01

S10356-01

## Back-illuminated type photodiodes employing CSP structure

The S10355-01 and S10356-01 are back-illuminated type photodiodes designed to minimize the dead areas at the device edges by using a CSP (chip size package) structure. The CSP also allows using multiple devices in a tiled format.

### Features

- **Allows multiple devices to be arranged in a tiled format**  
Tiled format minimizes the dead area between photodiodes and covers a large detection area.
- **Patterned electrodes for signal readout terminals**  
Lead pins and solder balls are available as signal readout terminals on the underside of the package. Please contact us for details.
- **Easy coupling to scintillator**  
Maximizes the optical coupling efficiency to a scintillator since no wire leads exist on the photosensitive surface, making these photodiodes ideal as detectors for X-ray non-destructive inspection systems.

### Applications

- **General industrial measurement**
- **X-ray inspection system**

### Structure

Parameter	S10355-01	S10356-01	Unit
Package size	7.52 × 7.52	3 × 3	mm
Chip size	7.37 × 7.37	2.8 × 2.8	mm
Photosensitive area	6.97 × 6.97	2.5 × 2.5	mm

### Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	$V_R$ max	$T_a=25\text{ }^\circ\text{C}$	10	V
Operating temperature	$T_{opr}$		-20 to +60	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-20 to +80	$^\circ\text{C}$
Reflow soldering condition*	$T_{sol}$		Peak temperature 240 $^\circ\text{C}$ (see page 3)	-

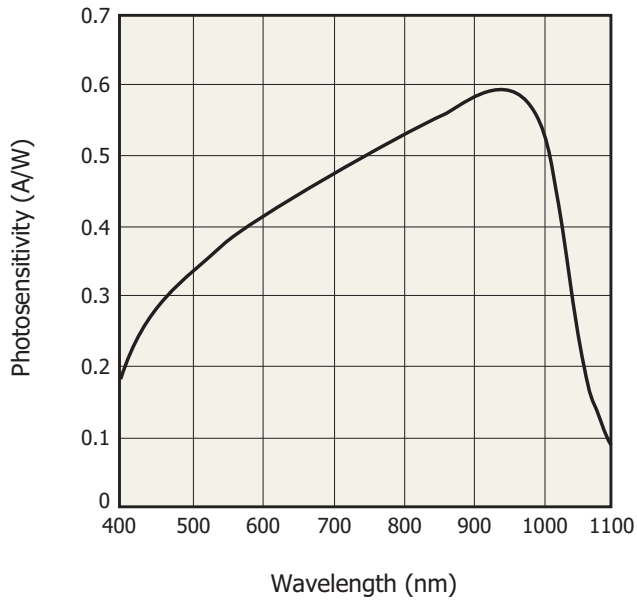
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

\* JEDEC level 5a

### Electrical and optical characteristics ( $T_a=25\text{ }^\circ\text{C}$ )

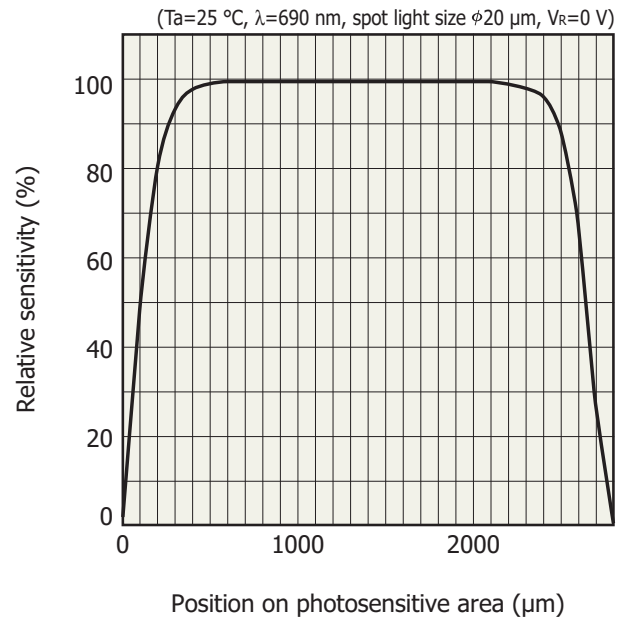
Parameter	Symbol	Condition	S10355-01			S10356-01			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		400 to 1100			400 to 1100			nm
Peak sensitivity wavelength	$\lambda_p$		-	960	-	-	960	-	nm
Photo sensitivity	S	$\lambda=960\text{ nm}$	0.55	0.59	-	0.55	0.59	-	A/W
		$\lambda=540\text{ nm}$	0.35	0.37	-	0.35	0.37	-	A/W
Short circuit current	$I_{sc}$	100 lx, 2856 K	30	40	-	4	5	-	$\mu\text{A}$
Dark current	$I_D$	$V_R=10\text{ mV}$	-	0.1	1	-	0.01	0.3	nA
Rise time	$t_r$	$V_R=0\text{ V}$ , $R_L=1\text{ k}\Omega$ $\lambda=650\text{ nm}$	-	20	-	-	15	-	$\mu\text{s}$
Terminal capacitance	$C_t$	$V_R=0\text{ V}$ , $f=10\text{ kHz}$	-	500	700	-	60	90	pF

**Spectral response**



KSPDB0288ED

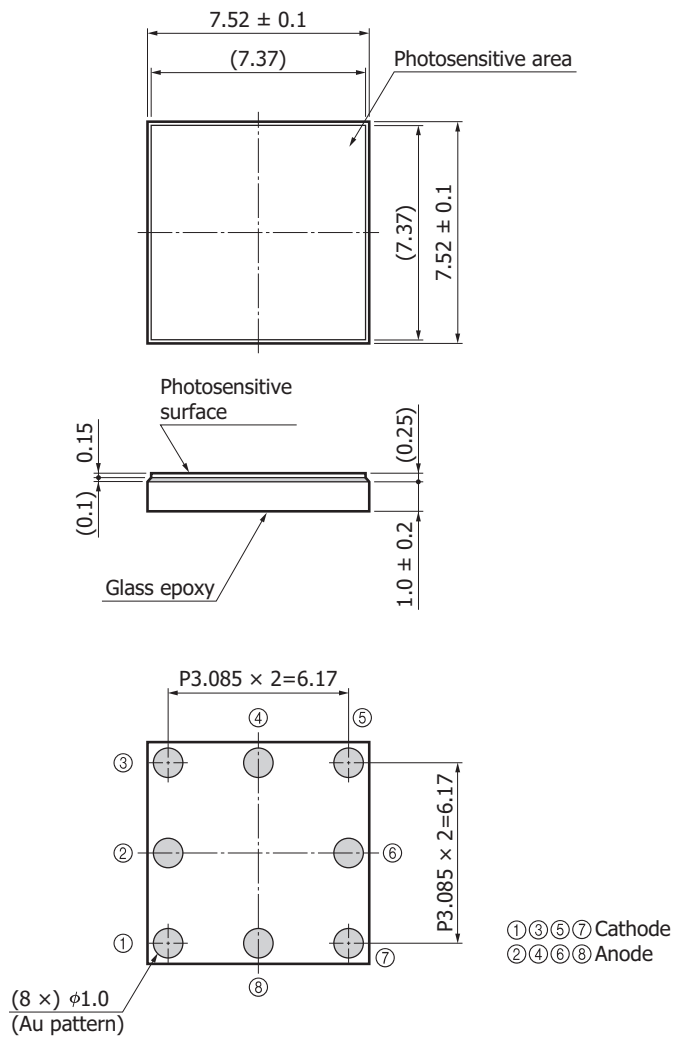
**Sensitivity uniformity (S10356-01)**



KSPDB0294EA

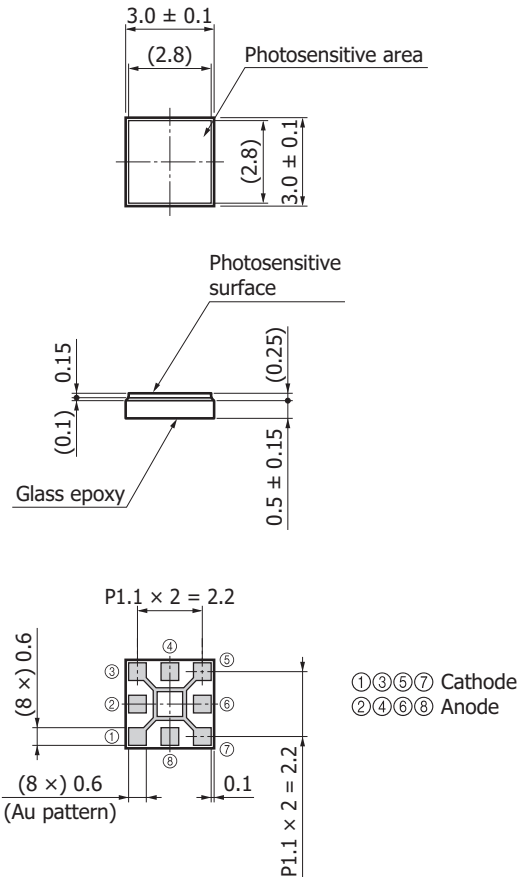
**Dimensional outlines (unit: mm)**

S10355-01



KSPDA0206EA

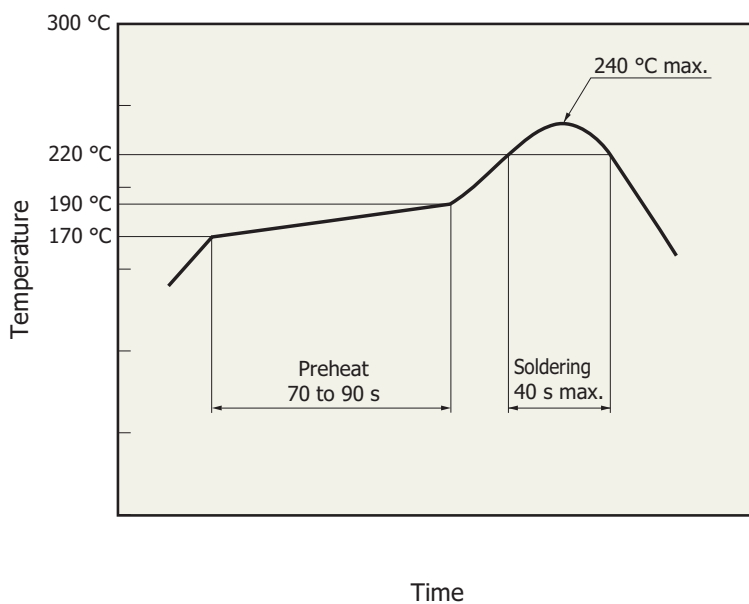
S10356-01



KSPDA0175ED

### Example of measured temperature profile with our hot-air reflow oven for product testing

These products support lead-free soldering. After unpacking, store them in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 24 hours.



KPICB0171EA

## Related information

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

### ■ Precautions

- Notice
- Surface mount type products / Precautions

### ■ Technical information

- Si photodiode / Application circuit examples

Information described in this material is current as of December, 2013.

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, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866