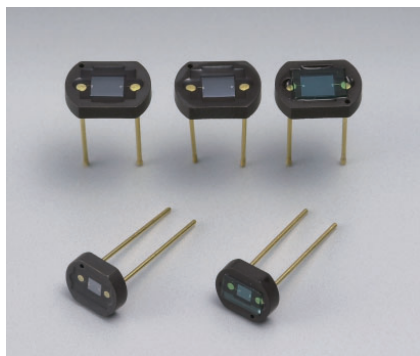


# Si photodiodes

S1087/S1133 series



## Ceramic package photodiodes with low dark current

The S1087/S1133 series are ceramic package photodiodes that offer low dark current. Ceramic package used is light-impervious, so no stray light can reach the photosensitive area from the side or backside. This allows reliable optical measurements in the visible to near infrared range, over a wide dynamic range from low light levels to high light levels.

### Features

- **S1087, S1133** : For visible range
- S1087-01, S1133-01** : For visible to IR range
- S1133-14** : For visible to near IR range

### Applications

- Exposure meters
- Illuminometers
- Copiers
- Display light control
- Optical switches

### Structure / Absolute maximum ratings

Type no.	Dimensional outline/ Window material*1	Photosensitive area size (mm)	Absolute maximum ratings		
			Reverse voltage V <sub>R</sub> max (V)	Operating temperature T <sub>opr</sub> (°C)	Storage temperature T <sub>stg</sub> (°C)
S1087	(1)/V	1.3 × 1.3	10	-10 to +60*2	-20 to +70*2
S1087-01	(2)/R				
S1133	(3)/V				
S1133-01	(4)/R	2.4 × 2.8			
S1133-14					

\*1: Window material R=resin coating, V=visual-compensation filter

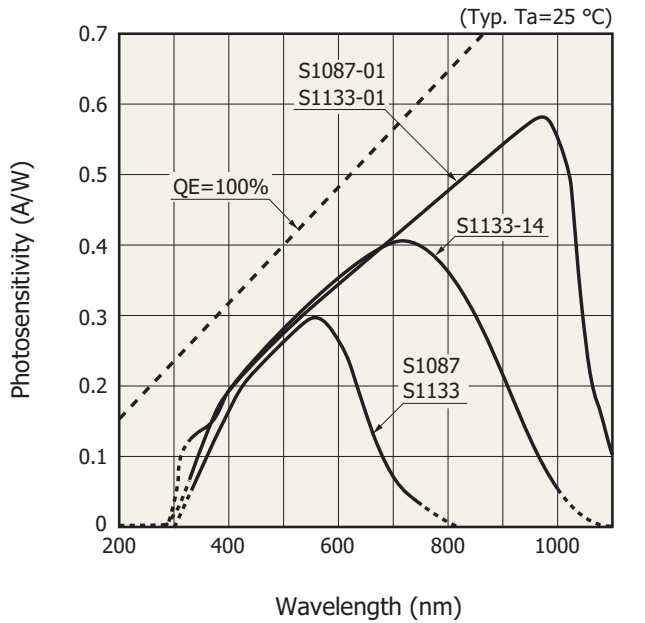
\*2: No condensation

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.

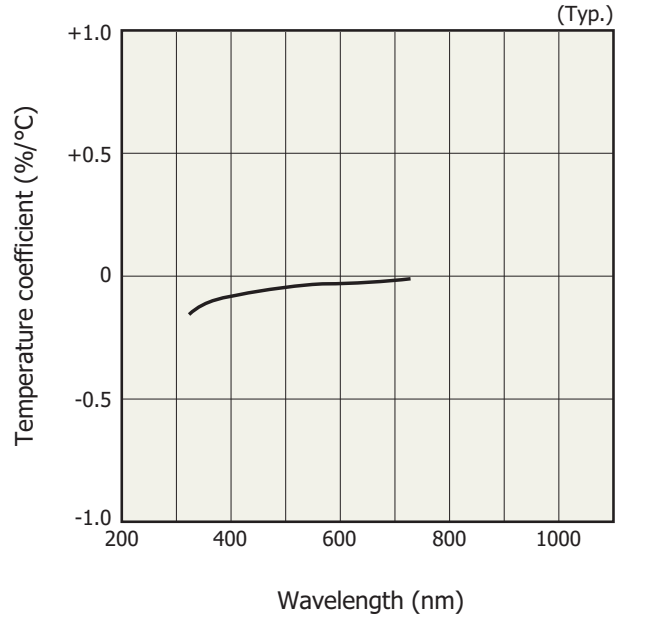
### Electrical and optical characteristics (Typ. T<sub>a</sub>=25 °C, unless otherwise noted)

Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ <sub>p</sub> (nm)	Photosensitivity S (A/W)			Infrared sensitivity ratio (%)	Short circuit current I <sub>sc</sub> 100 lx (μA)	Temp. coefficient of I <sub>sc</sub> (%/°C)	Dark current I <sub>D</sub> V <sub>R</sub> =1 V max. (pA)	Temp. coefficient of T <sub>CID</sub> (times/°C)	Rise time t <sub>r</sub> V <sub>R</sub> =0 V R <sub>L</sub> =1 kΩ (μs)	Terminal capacitance C <sub>t</sub> V <sub>R</sub> =0 V f=10 kHz (pF)	Shunt resistance R <sub>sh</sub> V <sub>R</sub> =10 mV	
			λ <sub>p</sub>	GaP LED 560 nm	He-Ne laser 633 nm								Min. (GΩ)	Typ. (GΩ)
S1087	320 to 730	560	0.3	0.3	0.19	10	0.16	-0.01	10	1.12	0.5	200	10	250
S1087-01	320 to 1100	960	0.58	0.33	0.38	-	1.3	0.1						100
S1133	320 to 730	560	0.3	0.3	0.19	10	0.61	-0.01	20	1.12	2.5	700	10	100
S1133-01	320 to 1100	960	0.58	0.33	0.38	-	5.4	0.1						50
S1133-14	320 to 1000	720	0.4	0.33	0.37	-	3.1	-			0.5	200		

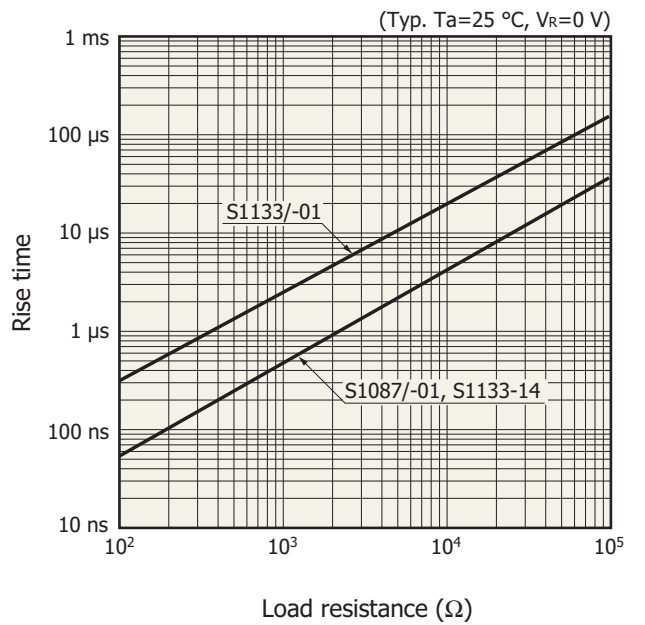
**Spectral response**



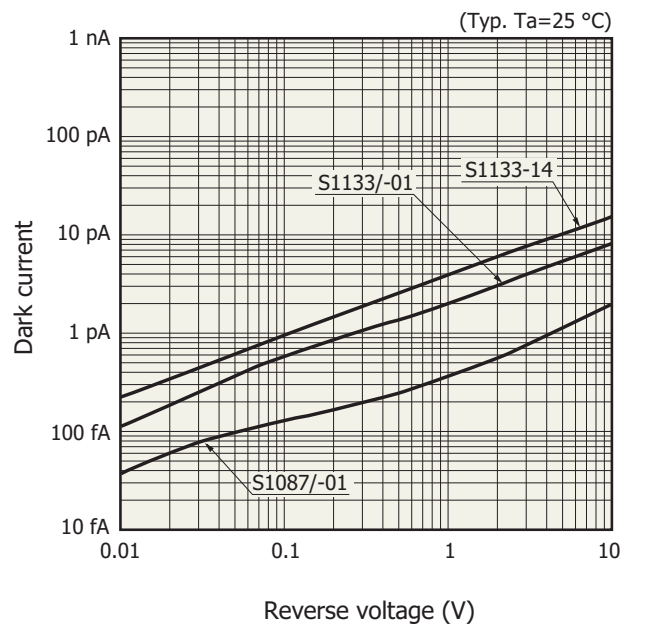
**Photosensitivity temperature characteristics (S1087)**



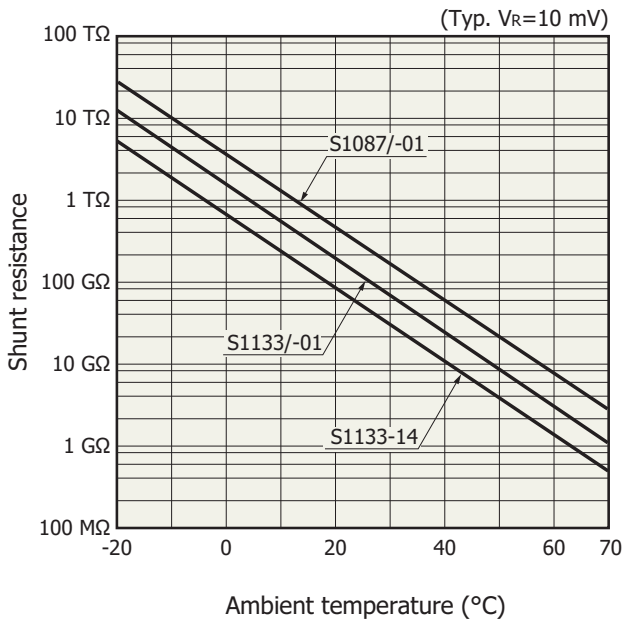
**Rise time vs. load resistance**



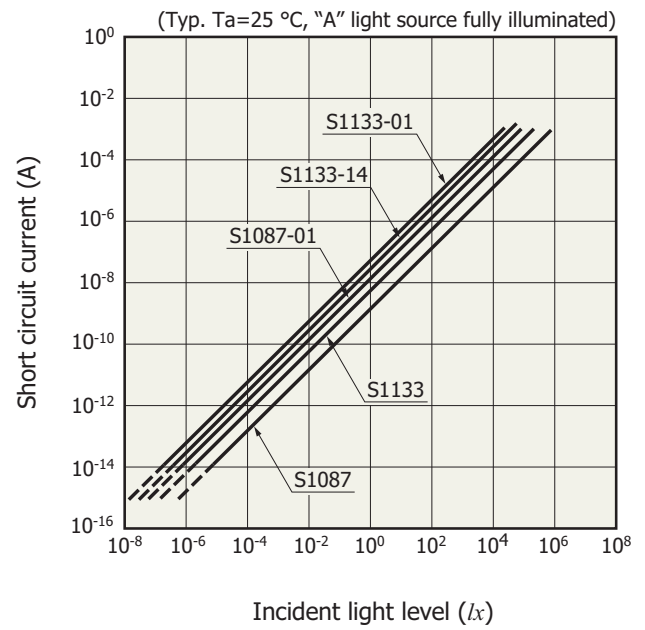
**Dark current vs. reverse voltage**



Shunt resistance temperature characteristics

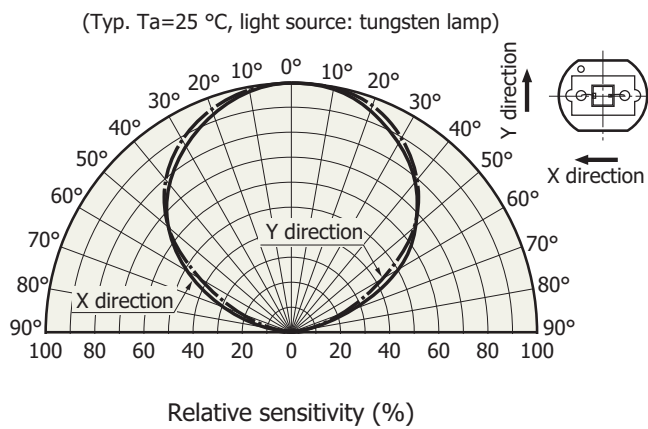


Short circuit current linearity

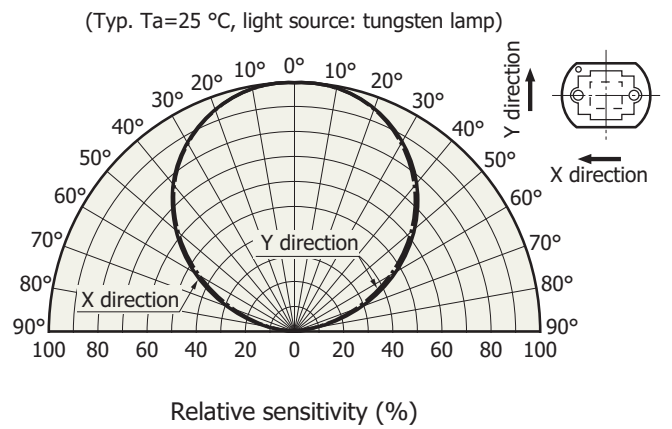


Directivity

S1087, S1133

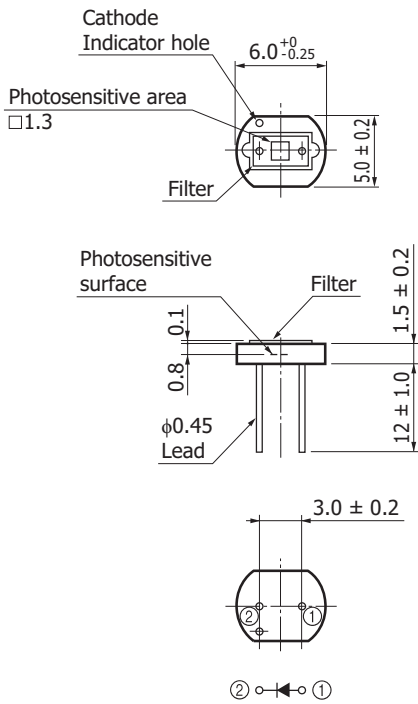


S1087-01, S1133-01/-14



Dimensional outlines (unit: mm)

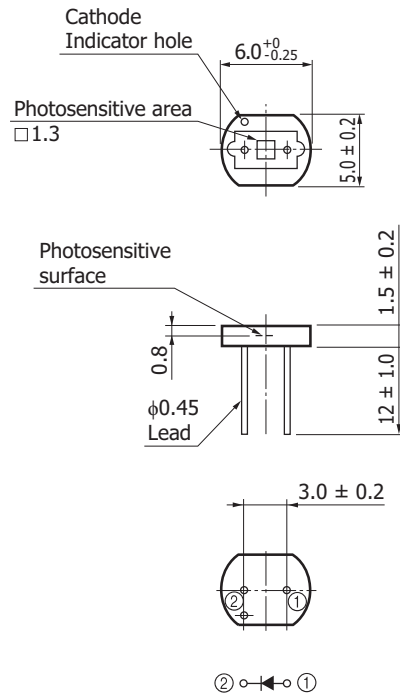
(1) S1087



Tolerance unless otherwise noted: ±0.15

KSPDA0053EA

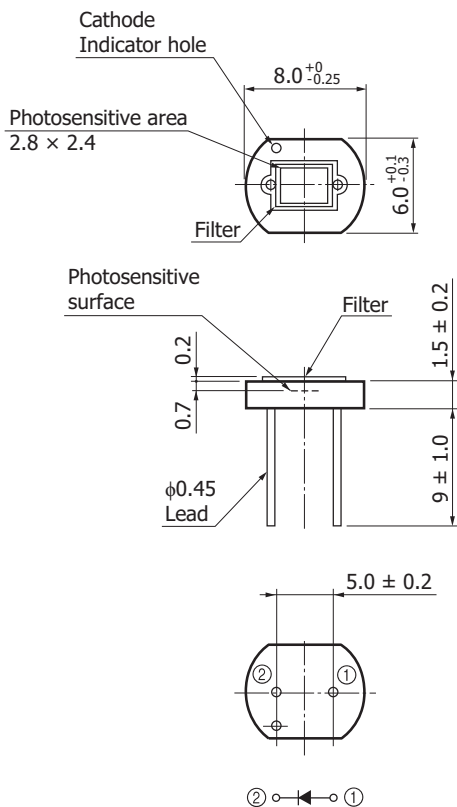
(2) S1087-01



Tolerance unless otherwise noted: ±0.15

KSPDA0052EA

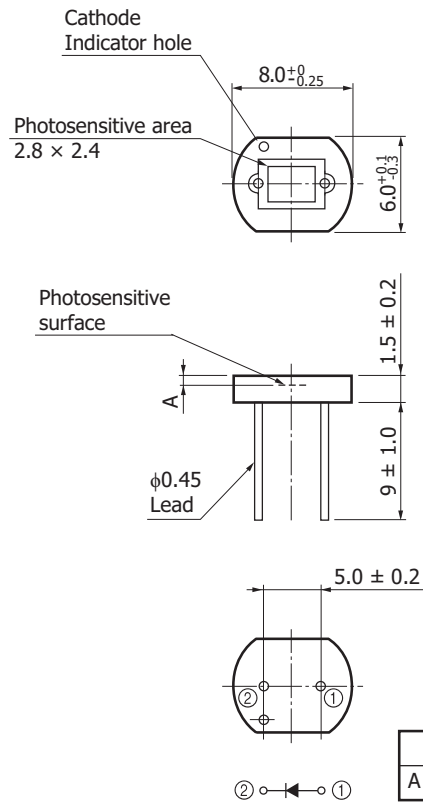
(3) S1133



Tolerance unless otherwise noted: ±0.15

KSPDA0055EA

(4) S1133-01/-14



Tolerance unless otherwise noted: ±0.15

KSPDA0054EA

	S1133-01	S1133-14
A	0.7	0.6

**Related information**

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

## ■ Precautions

- Notice
- Metal, Ceramic, Plastic products / Precautions

## ■ Technical information

- Si photodiode / Application circuit examples

Information described in this material is current as of March, 2014.

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.

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**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, P.O.Box 6910, Bridgewater, N.J. 08807-0910, 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: Thorshamnsgatan 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) 02-935-81-733, Fax: (39) 02-935-81-741

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866