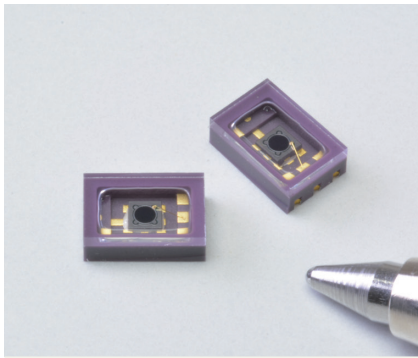


# Si PIN photodiode

S13337-01



## Si PIN photodiode for UV to near infrared region

The S13337-01 is a surface mount type Si PIN photodiode in a ceramic package with glass. This achieves high-speed response in the UV to near infrared region.

### Features

- High-speed response
- Surface mount type, compact, chip carrier package
- Compatible with lead-free reflow soldering

### Applications

- LD monitor
- Optical measurement equipment

### Structure

Parameter	Specification	Unit
Photosensitive area	φ0.8	mm
Package	Ceramic	-
Window material	Borosilicate glass	-

### Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V <sub>R</sub>		20	V
Operating temperature	T <sub>opr</sub>	No dew condensation*1	-25 to +85	°C
Storage temperature	T <sub>stg</sub>	No dew condensation*1	-40 to +100	°C
Soldering temperature	T <sub>sol</sub>		240 (3 times)*2	°C

\*1: 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.

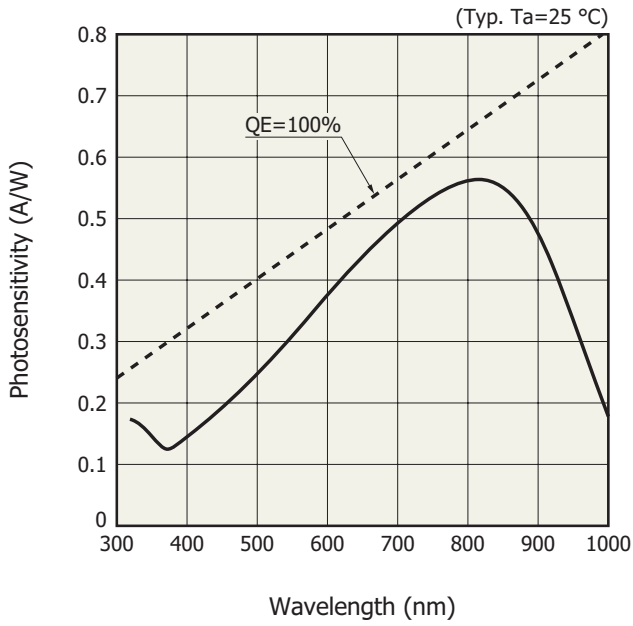
\*2: Reflow soldering, JEDEC J-STD-020 MSL 2, see P.4

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)

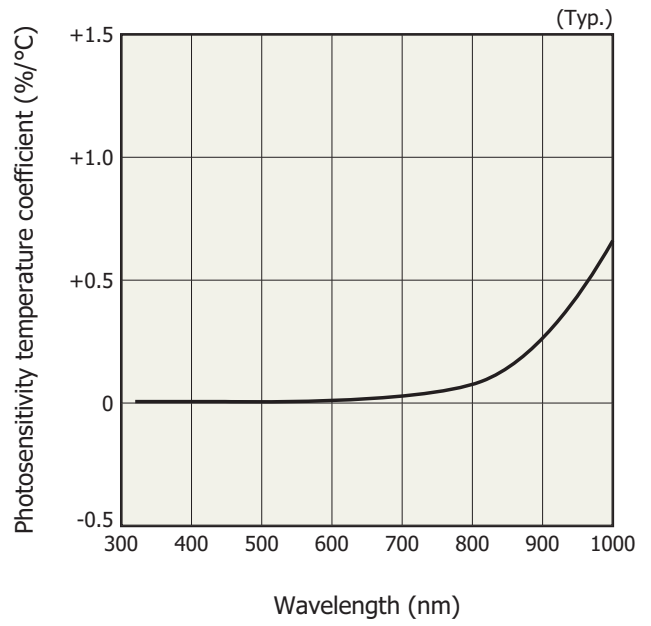
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	320 to 1000	-	nm
Peak sensitivity wavelength	λ <sub>p</sub>		-	800	-	nm
Photosensitivity	S	λ=λ <sub>p</sub>	500	570	-	mA/W
Dark current	I <sub>D</sub>	V <sub>R</sub> =10 V	-	3	500	pA
Temperature coefficient of I <sub>D</sub>	I <sub>CID</sub>		-	1.15	-	times/°C
Cutoff frequency	f <sub>c</sub>	V <sub>R</sub> =10 V, R <sub>L</sub> =50 Ω λ=830 nm, -3 dB	-	500	-	MHz
Terminal capacitance	C <sub>t</sub>	V <sub>R</sub> =10 V, f=1 MHz	-	3	-	pF
Noise equivalent power	NEP	V <sub>R</sub> =10 V, λ=λ <sub>p</sub>	-	3.1 × 10 <sup>-15</sup>	-	W/Hz <sup>1/2</sup>

**Spectral response**



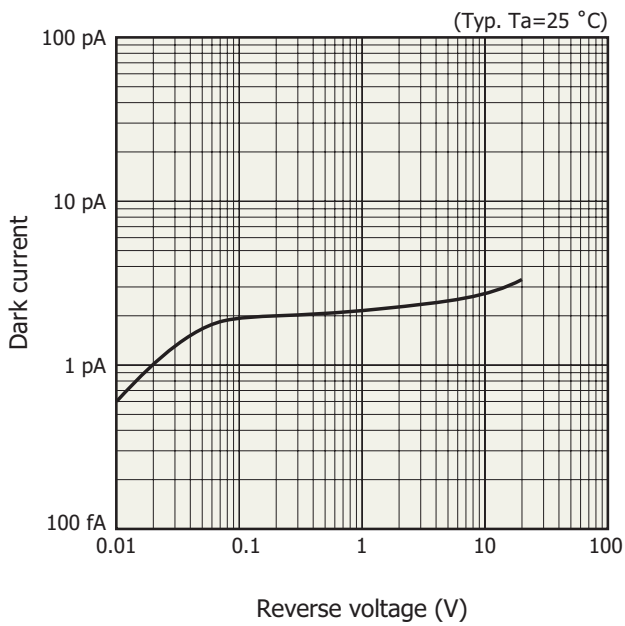
KPINB0453EA

**Photosensitivity temperature characteristics**



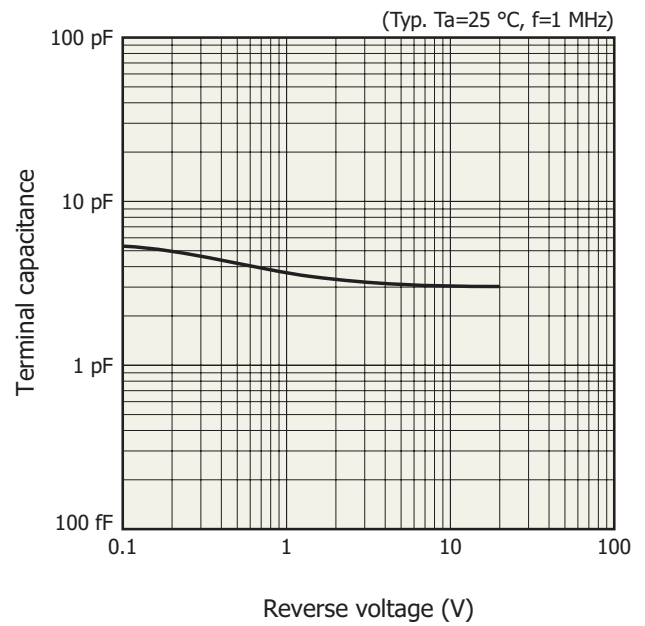
KPINB0454EA

**Dark current vs. reverse voltage**



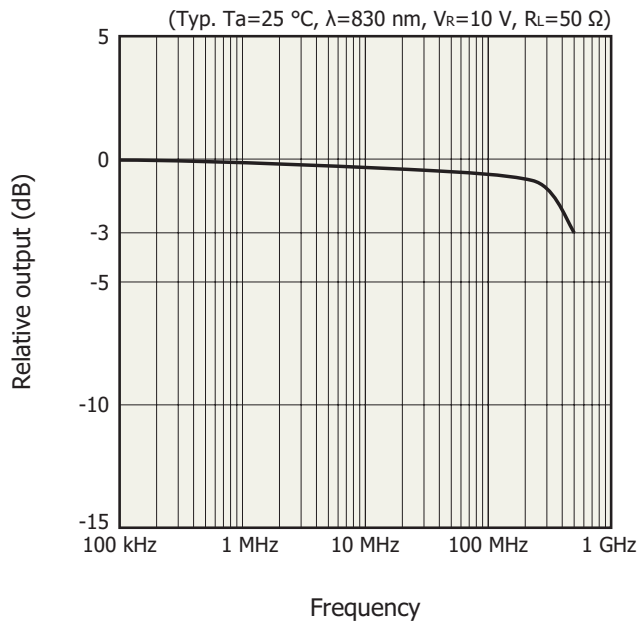
KPINB0455EA

**Terminal capacitance vs. reverse voltage**

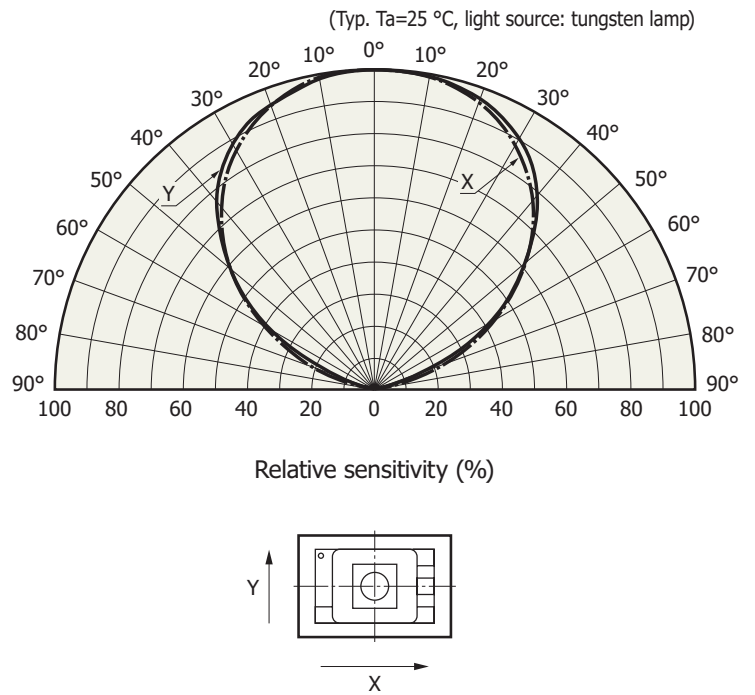


KPINB0456EA

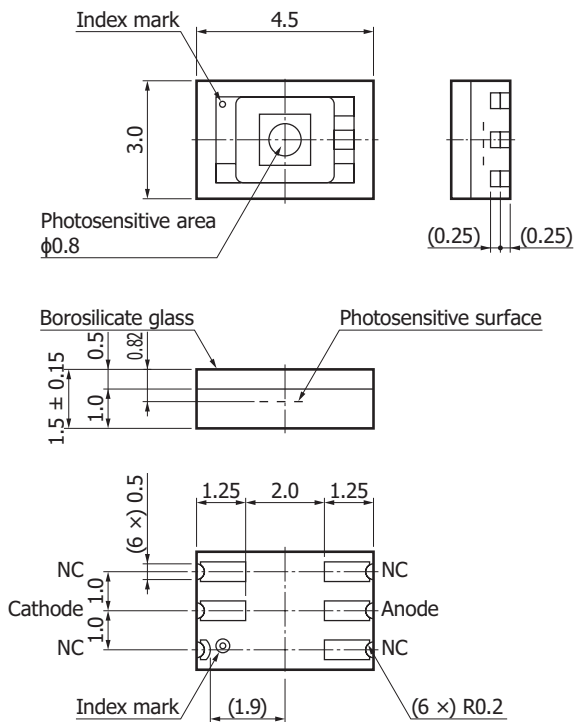
**Frequency response**



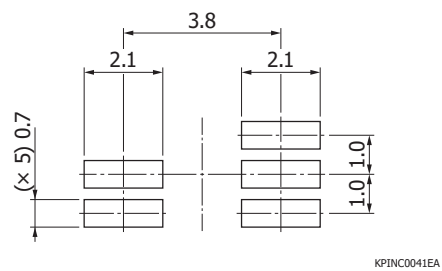
**Directivity**



**Dimensional outline (unit: mm)**



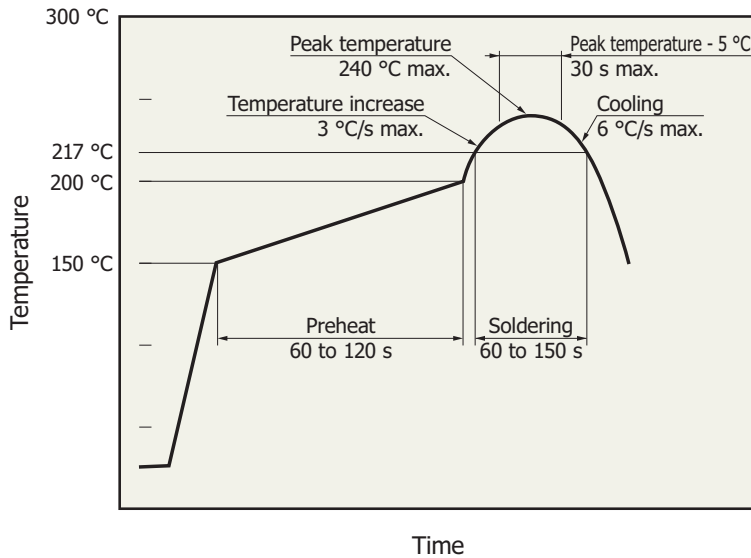
**Recommended land pattern (unit: mm)**



Tolerance unless otherwise noted:  $\pm 0.1$   
 Chip position accuracy with respect to package center  
 $-0.2 \leq X \leq +0.2$   
 $-0.2 \leq Y \leq +0.2$

KPINA0127EA

### Recommended reflow soldering conditions



- After unpacking, store the device in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform reflow soldering within 1 year.
- The effect that the product receives during reflow soldering varies depending on the circuit board and the reflow oven that are used. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

KSPDB0400EB

### 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 note

- Si photodiodes

Information described in this material is current as of March 2023.

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, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218

Germany: HAMAMATSU PHOTONICS DEUTSCHLAND GMBH: Arzbergerstr. 10, 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 20044 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 Bellu, 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, Section 2, 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)