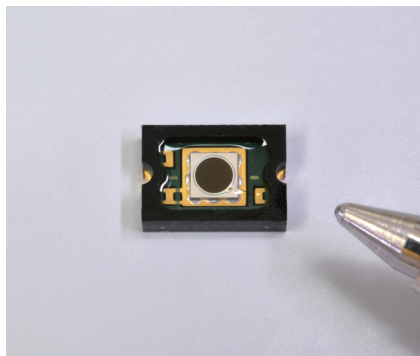


# Si PIN photodiode



S13954-01CT

## High-speed response and wide temperature range

The S13954-01CT is a photodiode that has an extremely wide operating and storage temperature range (-40 to +125 °C). A high-speed response (230 MHz typ.) is achieved.

### Features

- High-speed response: 230 MHz  
( $V_R=3\text{ V}$ ,  $R_L=50\ \Omega$ ,  $\lambda=650\text{ nm}$ , -3 dB)
- Operating/storage temperature: -40 to +125 °C
- Surface mount type, small and thin leadless package
- Photosensitive area:  $\phi 1.5\text{ mm}$
- Suitable for lead-free solder reflow

### Applications

- Laser power monitoring, etc.

### Structure

Parameter	Value	Unit
Photosensitive area	$\phi 1.5$	mm
Package	Epoxy/Glass	-
Window material	Silicone resin	-

### Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	$V_R\text{ max.}$	10	V
Operating temperature	$T_{opr}$	-40 to +125	°C
Storage temperature	$T_{stg}$	-40 to +125	°C
Reflow soldering conditions*1	$T_{sol}$	Peak temperature: 260 °C, twice (see P.5)	-

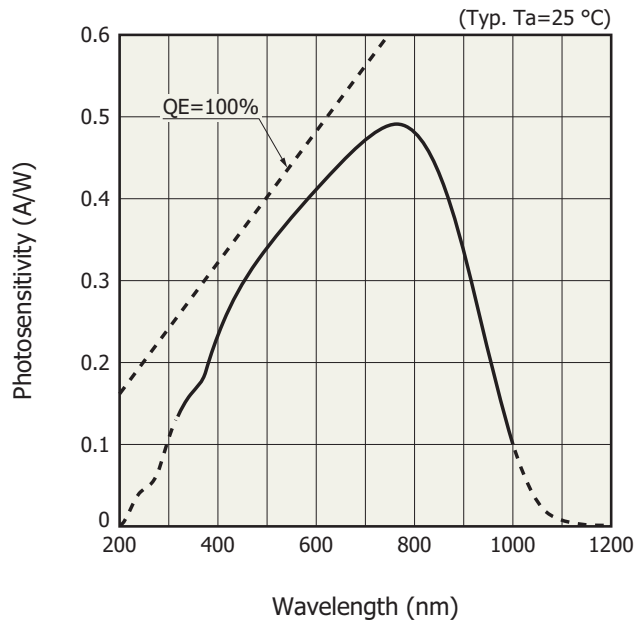
\*1: JEDEC level 4

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)

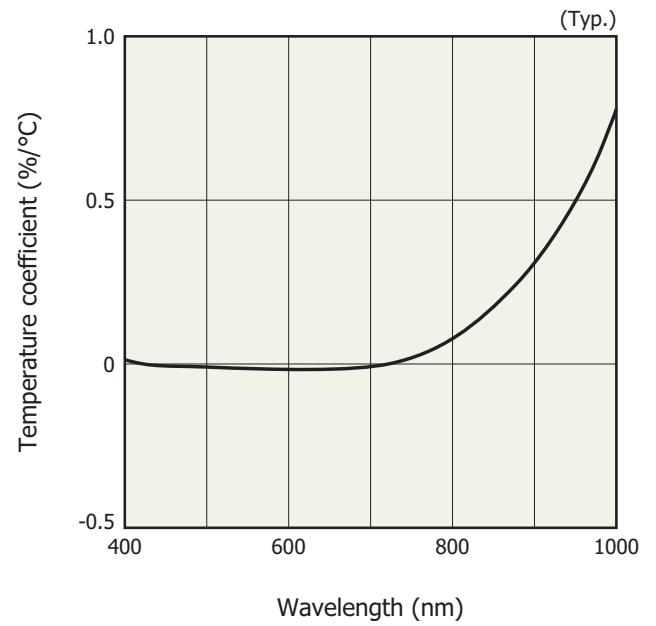
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$		-	320 to 1000	-	nm
Peak sensitivity wavelength	$\lambda_p$		-	780	-	nm
Photosensitivity	S	$\lambda=\lambda_p$	0.4	0.5	-	A/W
Dark current	$I_D$	$V_R=3\text{ V}$	-	0.01	1	nA
Temperature coefficient of $I_D$	$T_{CID}$	$V_R=3\text{ V}$	-	1.12	-	times/°C
Cutoff frequency	$f_c$	$V_R=3\text{ V}$ , $R_L=50\ \Omega$ $\lambda=650\text{ nm}$ , -3 dB	125	230	-	MHz
Terminal capacitance	$C_t$	$V_R=3\text{ V}$ , $f=1\text{ MHz}$	-	13	25	pF

**Spectral response**



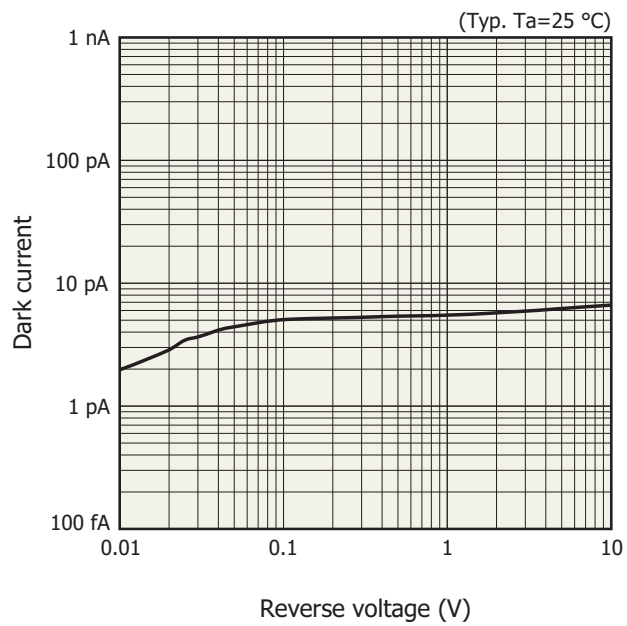
KPINB0423EA

**Photosensitivity temperature characteristics**



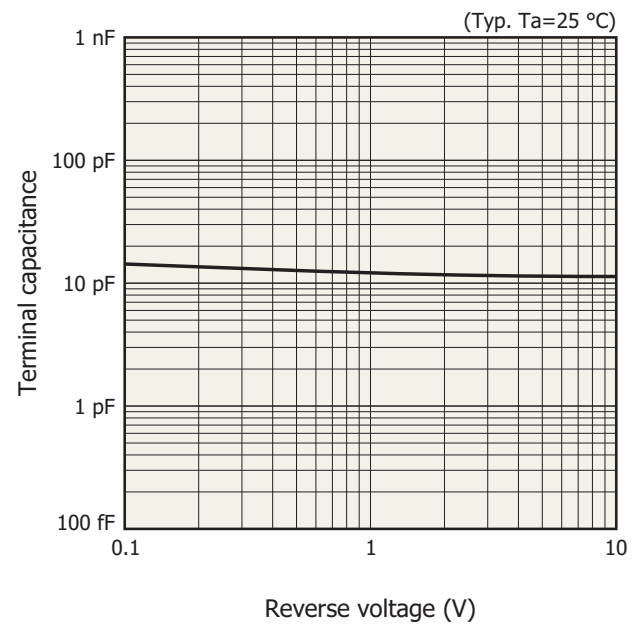
KPINB0424EA

**Dark current vs. reverse voltage**



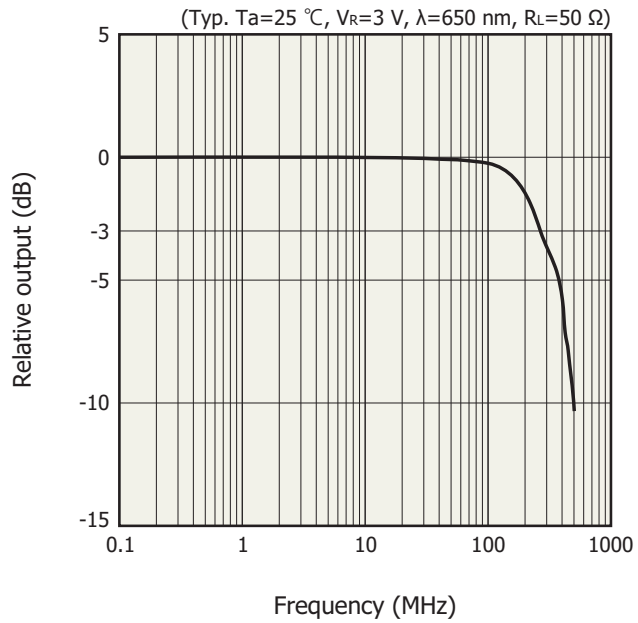
KPINB0425EA

**Terminal capacitance vs. reverse voltage**

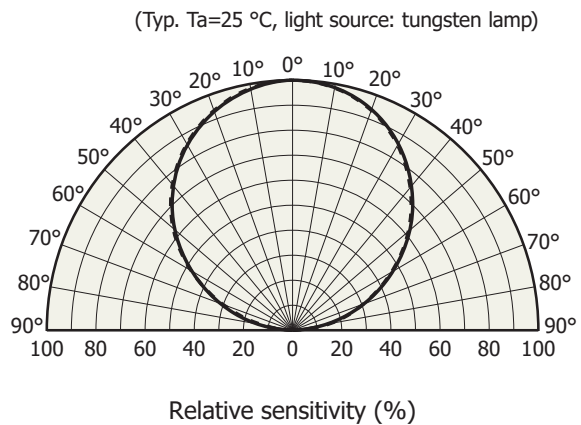


KPINB0426EA

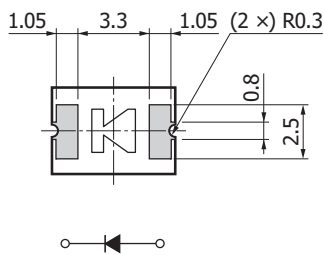
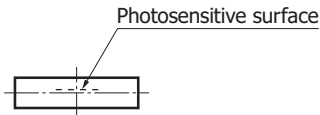
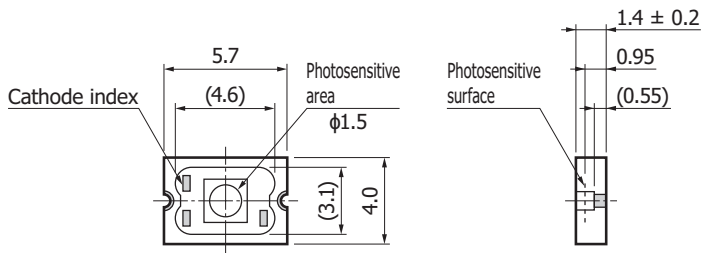
### Frequency characteristics



### Directivity



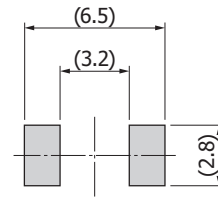
**Dimensional outline (unit: mm)**



Tolerance unless otherwise noted:  
 $\pm 0.15$ ,  $\pm 2^\circ$   
 Chip position accuracy with respect to package center  
 $X, Y \leq 0.2$ ,  $\theta \leq \pm 2^\circ$

KPINA0123EA

**Recommended land pattern**



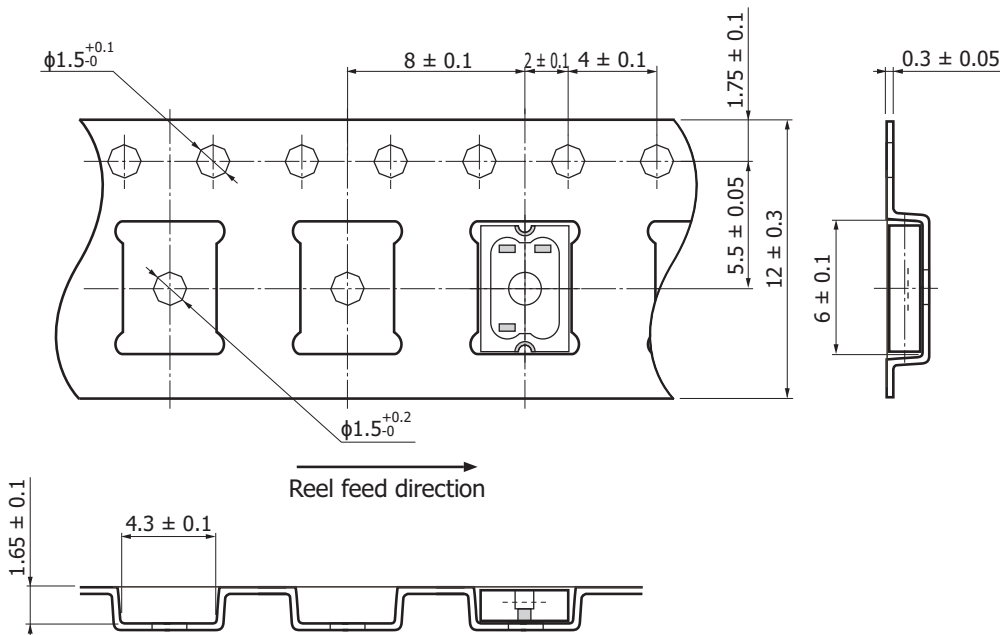
KPINC0034EA

**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)

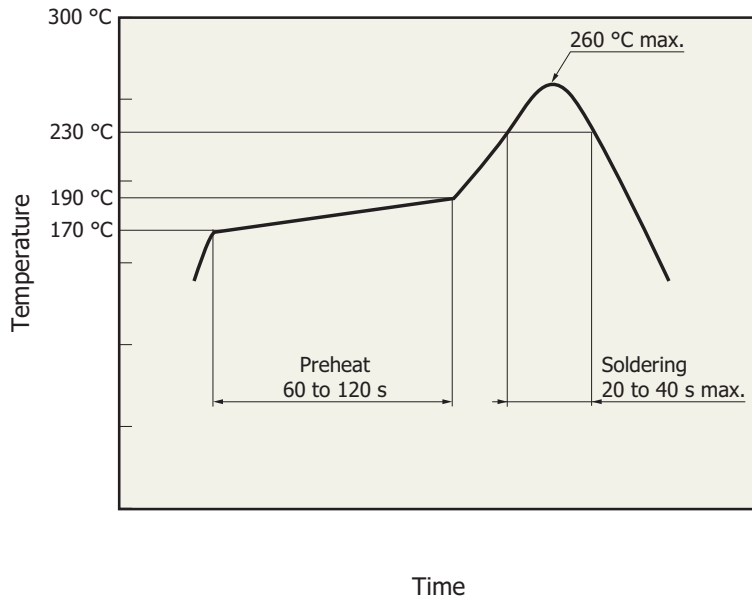


KPINC0035EA

- Packing quantity  
2000 pcs/reel

- Packing type  
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

### Recommended reflow soldering conditions



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 tesitng 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 January 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)