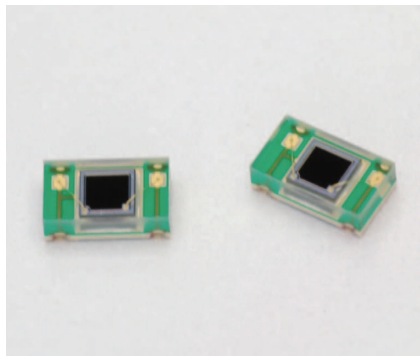


# Si PIN photodiode



S10993-02CT

**COB type, applicable to lead-free solder reflow**

The S10993-02CT is a Si PIN photodiode for visible to near infrared range and is compatible with lead-free solder reflow processes. The small and thin leadless package allows reducing the mount area on a printed circuit board.

## Features

- COB type
- Small package: 3.1 × 1.8 × 0.8<sup>t</sup> mm
- Applicable to lead-free solder reflow
- Photosensitive area: 1.06 × 1.06 mm

## Applications

- Optical switches

## Structure

Parameter	Specification	Unit
Photosensitive area	1.06 × 1.06	mm
Package	Glass epoxy	-
Seal material	Silicone resin	-

## Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V <sub>R</sub> max	T <sub>a</sub> =25 °C	10	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
Reflow soldering conditions*2	T <sub>sol</sub>		Peak temperature 260 °C max., 2 times (see P.6)	-

\*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

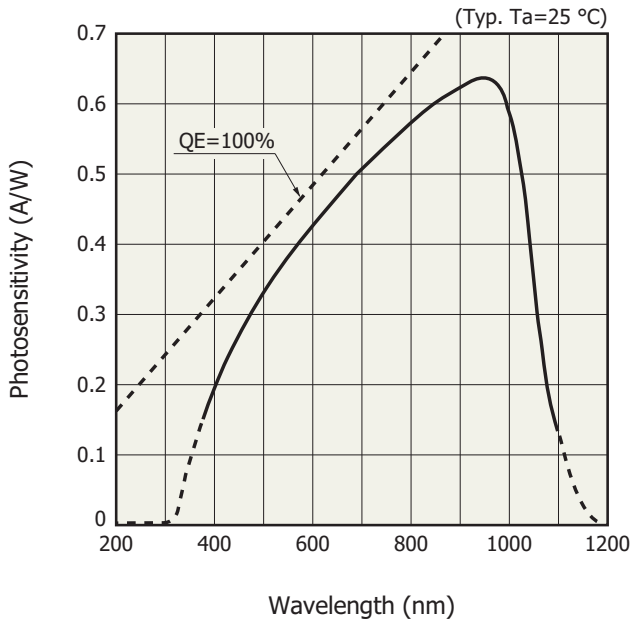
\*2: JEDEC level 2a

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 (T<sub>a</sub>=25 °C)

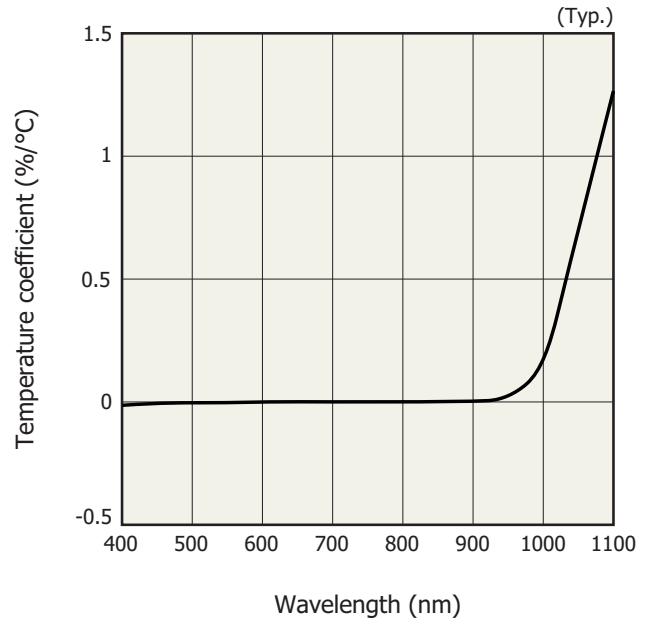
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	380 to 1100	-	nm
Peak sensitivity wavelength	λ <sub>p</sub>		-	960	-	nm
Photosensitivity	S	λ=650 nm	0.41	0.46	-	A/W
		λ=λ <sub>p</sub>	-	0.6	-	
Short circuit current	I <sub>sc</sub>	100 lx, 2856 K	-	1.2	-	μA
Dark current	I <sub>D</sub>	V <sub>R</sub> =2.5 V	-	0.02	1	nA
Cutoff frequency	f <sub>c</sub>	V <sub>R</sub> =2.5 V, λ=650 nm R <sub>L</sub> =50 Ω, -3 dB	5	10	-	MHz
Terminal capacitance	C <sub>t</sub>	V <sub>R</sub> =2.5 V, f=1 MHz	-	6	12	pF

**Spectral response**



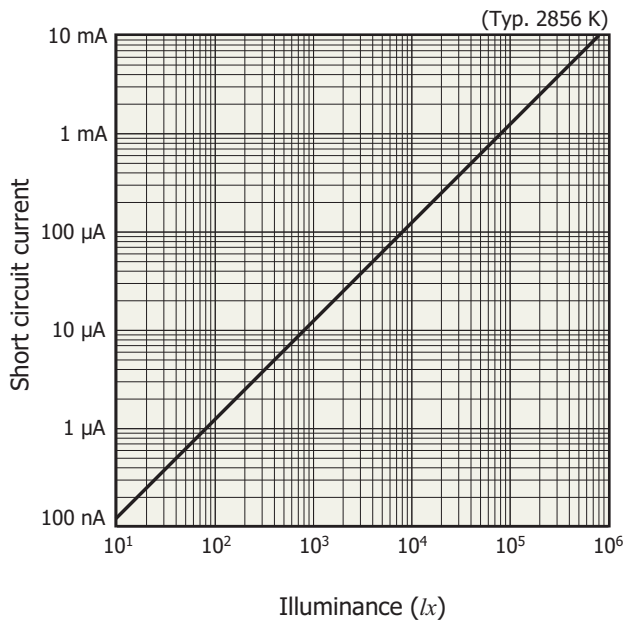
KPINB0390EA

**Photosensitivity temperature characteristics**



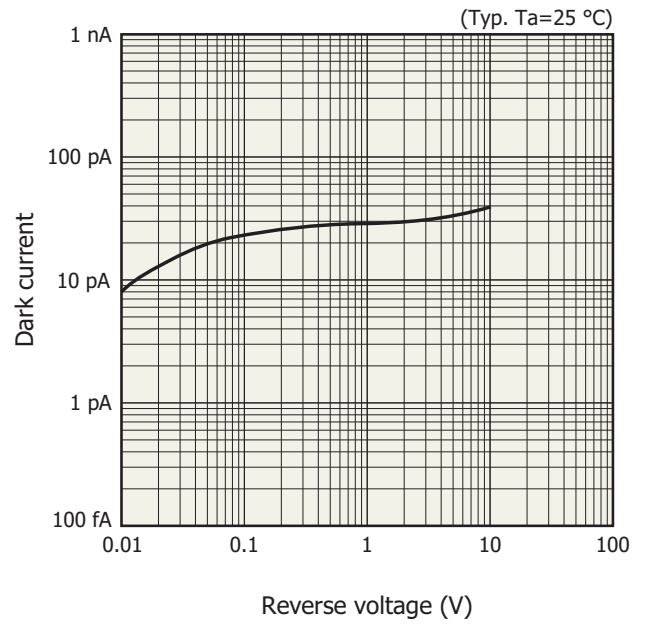
KPINB0398EB

**Linearity**



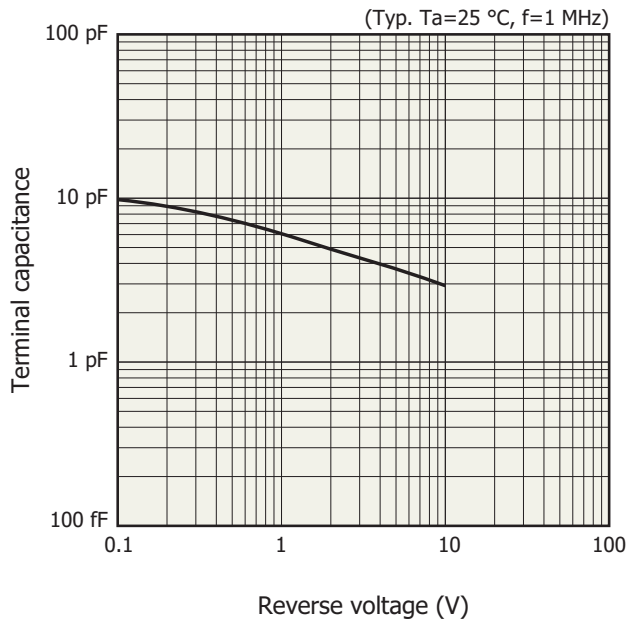
KPINB0397EA

**Dark current vs. reverse voltage**



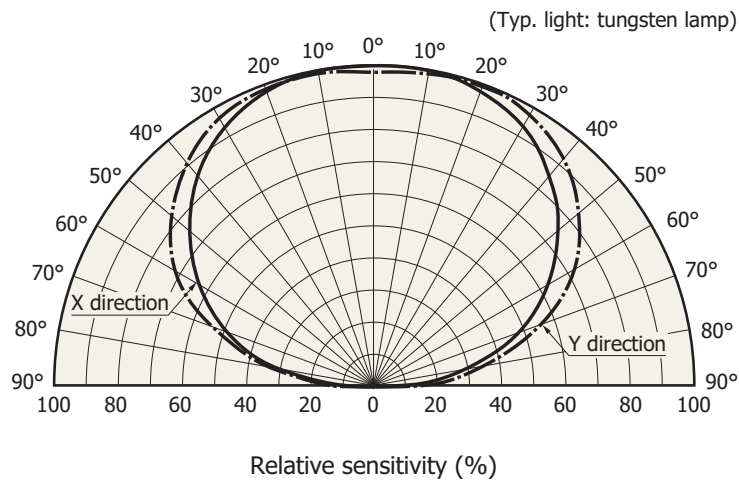
KPINB0391EA

**Terminal capacitance vs. reverse voltage**



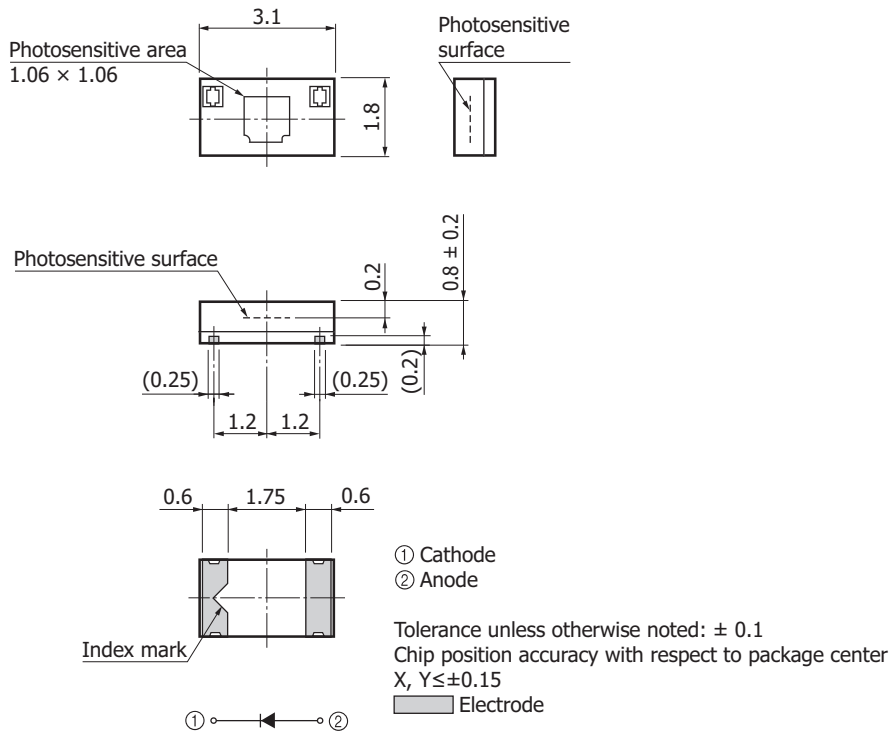
KPINB0392EA

**Directivity**



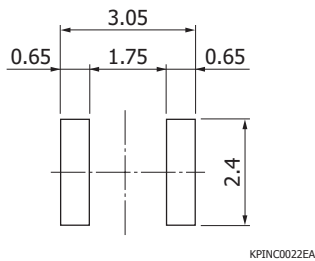
KPINB0399EA

### Dimensional outline (unit: mm)



KPINA0118EA

### Recommended land pattern (unit: mm)

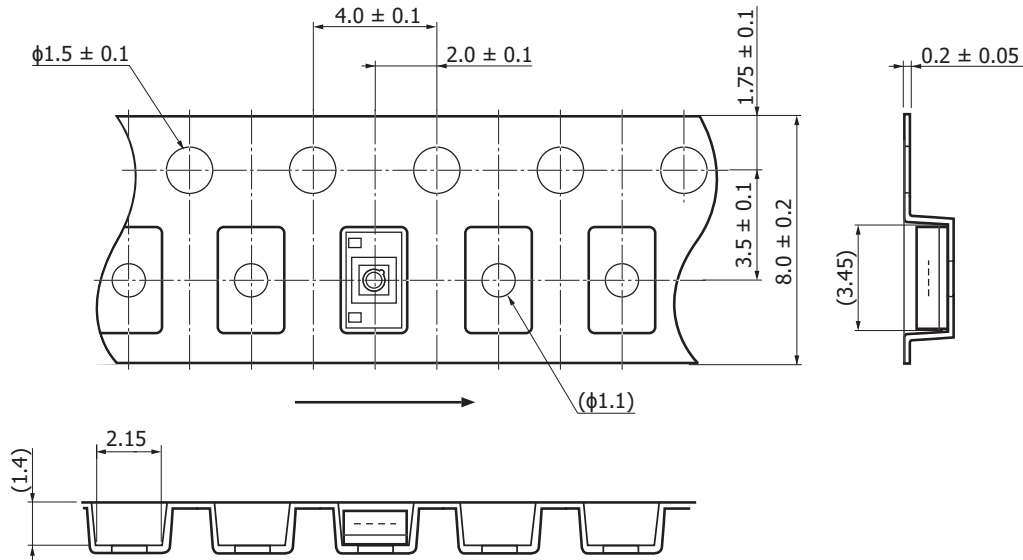


### Standard packing specifications

- Reel (conforms to JEITA ET-7200)

Dimensions	Hub diameter	Tape width	Material	Electrostatic characteristics
180 mm	60 mm	8 mm	PS	Conductive

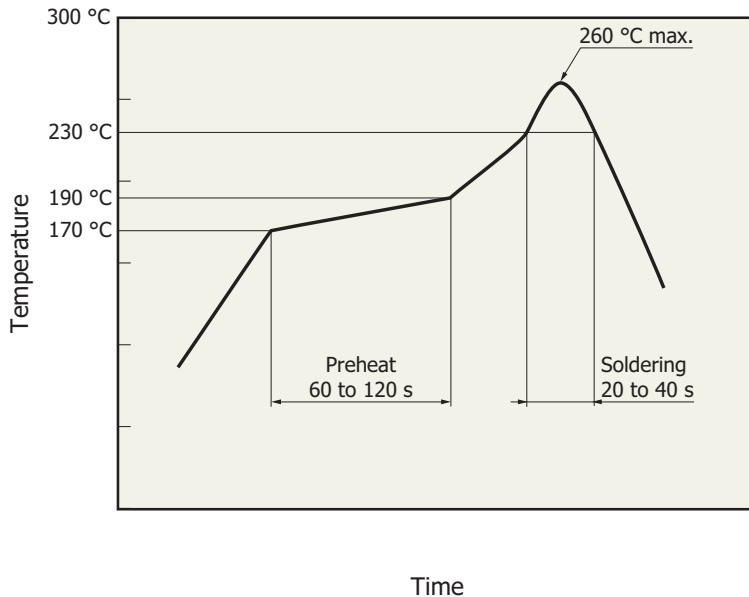
- Embossed tape (unit: mm, material: PS, conductive)



KPINC0023EA

- Packing quantity  
3000 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



KPINB0403EB

- 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 4 weeks.
- 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.

### Precautions

Do not touch the silicone resin surface. As the silicone resin is soft, applying external force to it can cause damage to the resin surface and cause short circuit or broken circuit due to wire deformation.

### 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 February 2019.

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.

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