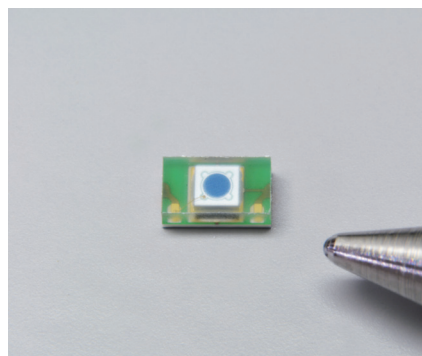




Si PIN photodiode

S13773

S15193

Surface mount type, high-speed Si photodiodes

The S13773 and S15193 are Si PIN photodiodes with sensitivities in the visible to near infrared range and are compatible with lead-free solder reflow. The S13773 features high-speed response while the S15193 features improved near infrared sensitivity. They are suitable for distance measurement laser monitoring.

Features

- High-speed response: 500 MHz ($V_R=10$ V)
- High sensitivity in the near IR region: 0.64 A/W (S15193, $\lambda=920$ nm)
- Surface mount type
- High reliability (wide temperature range)
- Compatible with lead-free solder reflow

Applications

- Distance measurement laser monitor
- Light monitor (from visible to near infrared region)

Structure

Parameter	Symbol	Specification	Unit
Photosensitive area	-	$\phi 0.8$	mm
Package	-	Glass epoxy	-
Window material	-	Silicone resin	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R max		20	V
Operating temperature	T_{opr}	No dew condensation*1	-40 to +100	°C
Storage temperature	T_{stg}	No dew condensation*1	-40 to +100	°C
Soldering conditions*2	-	JEDEC J-STD-033C MSL 2a	Peak temperature: 260 °C, 3 times*2	-

*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.

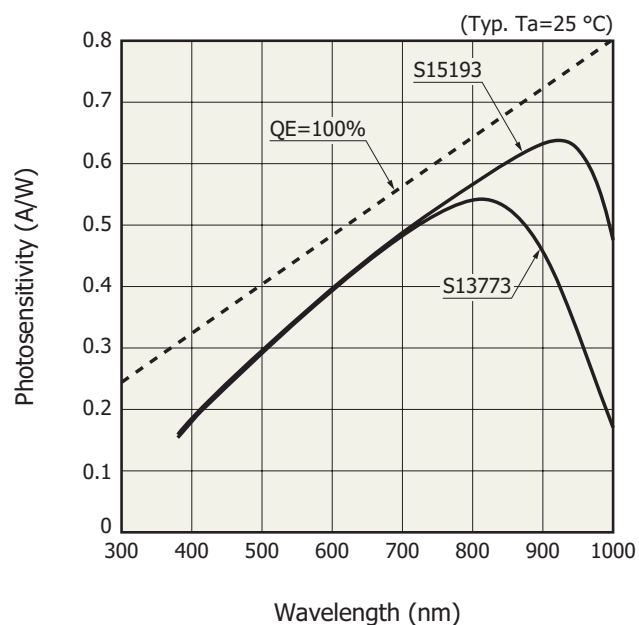
*2: See P.5. JEDEC J-STD-020 MSL 2a

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.

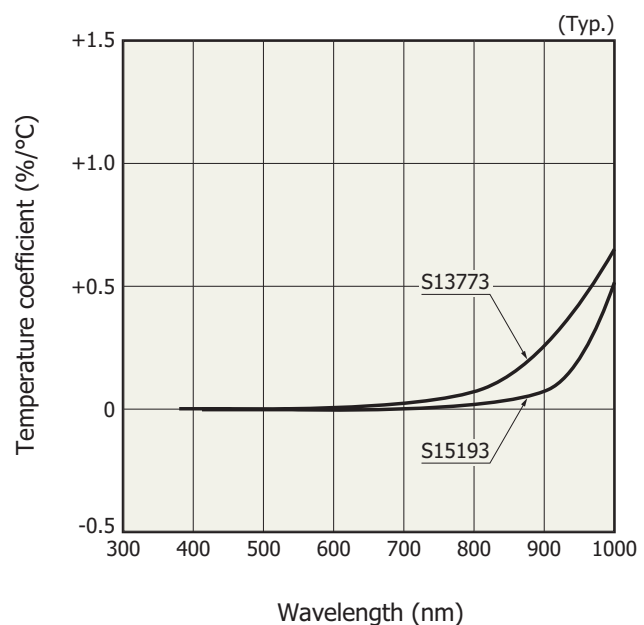
Electrical and optical characteristics ($T_a=25$ °C)

Parameter	Symbol	Condition	S13773			NEW S15193			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	λ		-	380 to 1000	-	-	380 to 1000	-	nm
Peak sensitivity wavelength	λ_p		-	800	-	-	920	-	nm
Photosensitivity	S	$\lambda=\lambda_p$	0.5	0.54	-	0.6	0.64	-	A/W
Dark current	I_D	$V_R=10$ V	-	10	500	-	10	500	pA
Dark current temperature coefficient	ΔTID		-	1.15	-	-	1.15	-	times/°C
Cutoff frequency	f_c	$\lambda=830$ nm, $V_R=10$ V $R_L=50$ Ω , -3 dB	-	500	-	-	100	-	MHz
Terminal capacitance	C_t	$V_R=10$ V, $f=10$ kHz	-	3	4	-	2	3	pF
Noise equivalent power	NEP	$V_R=10$ V, $\lambda=\lambda_p$	-	1.1×10^{-14}	8.3×10^{-14}	-	9.2×10^{-15}	6.9×10^{-14}	W/Hz ^{1/2}

Spectral response

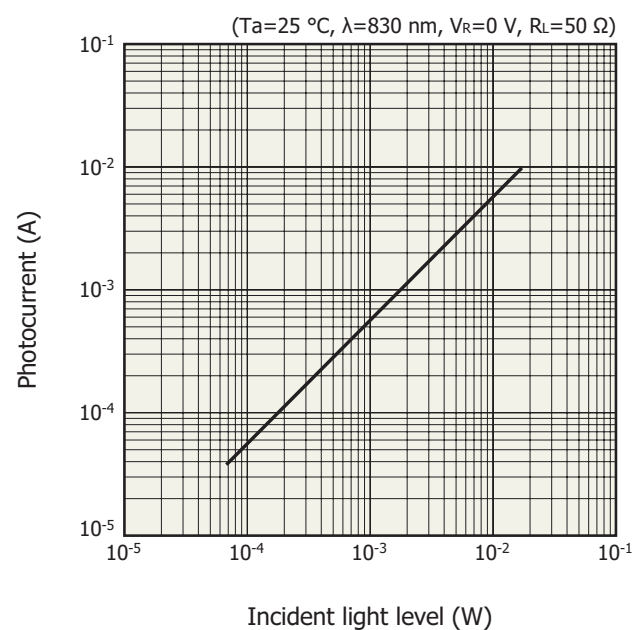


Photosensitivity temperature characteristics

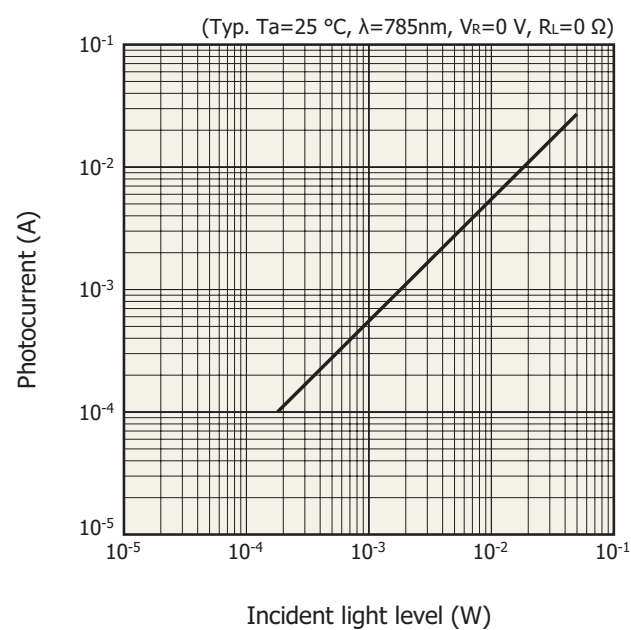


Linearity

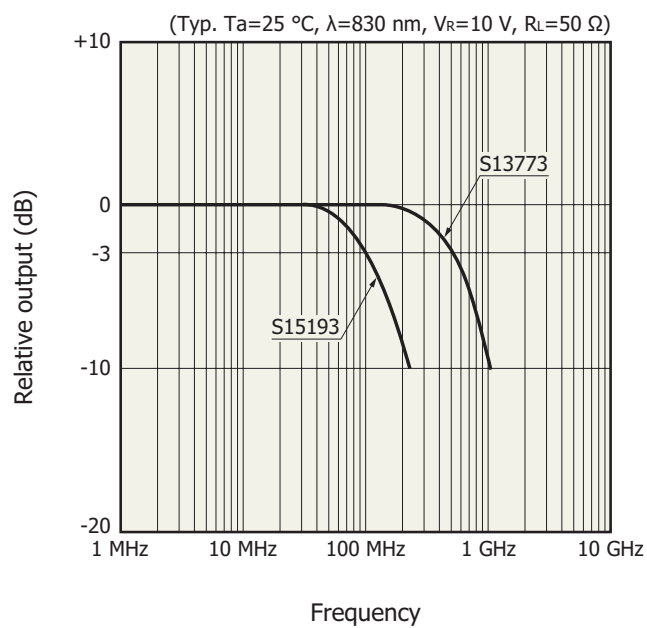
S13773



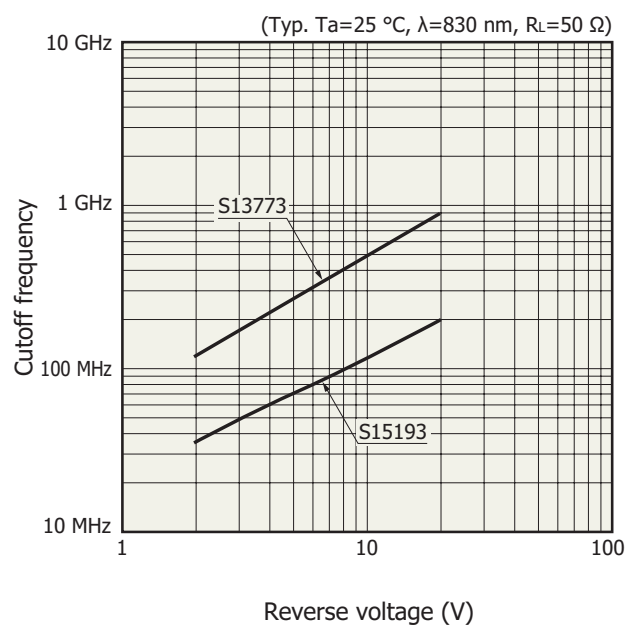
S15193



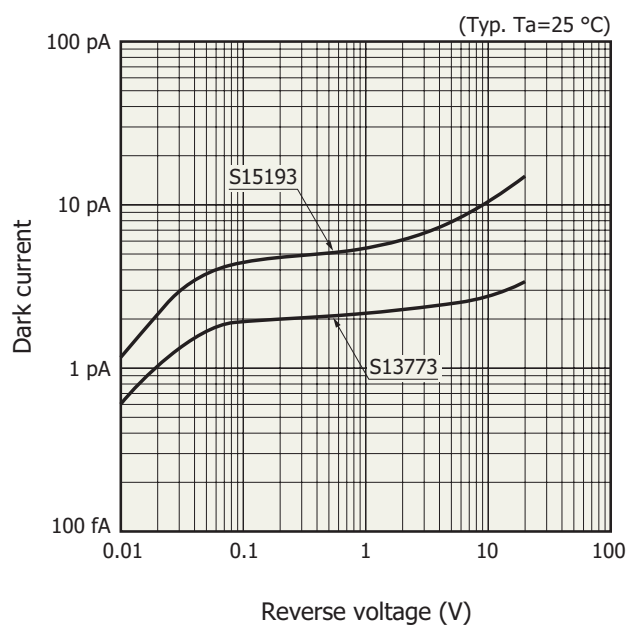
Frequency characteristics



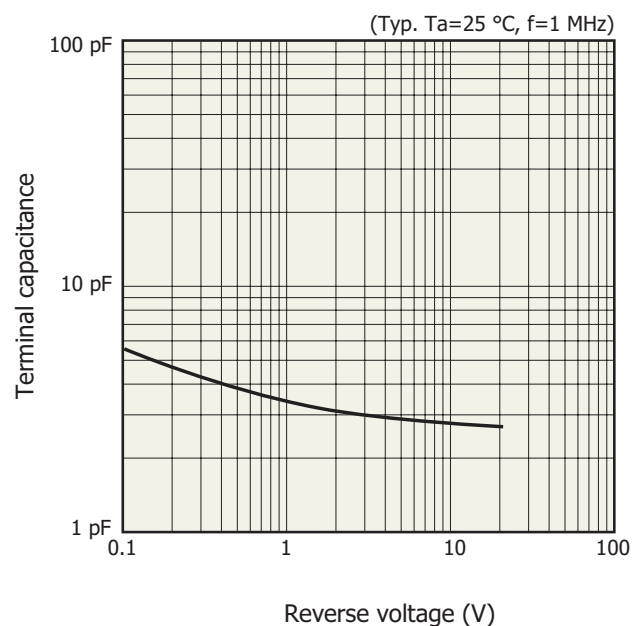
Cutoff frequency vs. reverse voltage



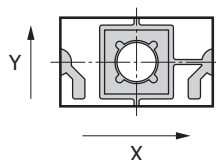
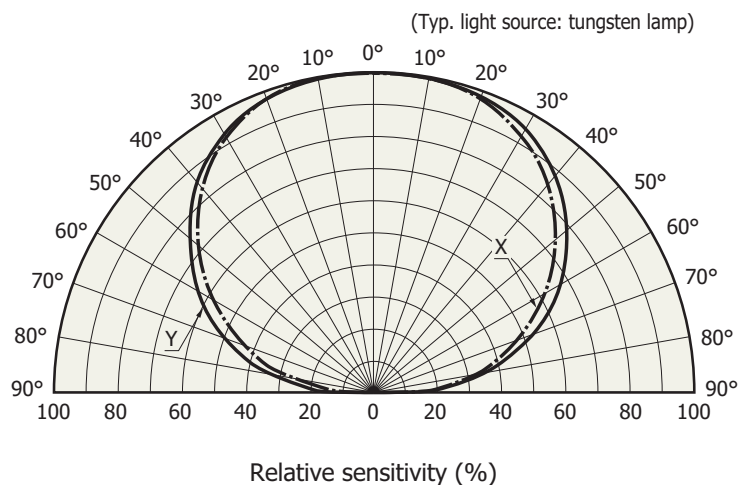
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage (S13773)

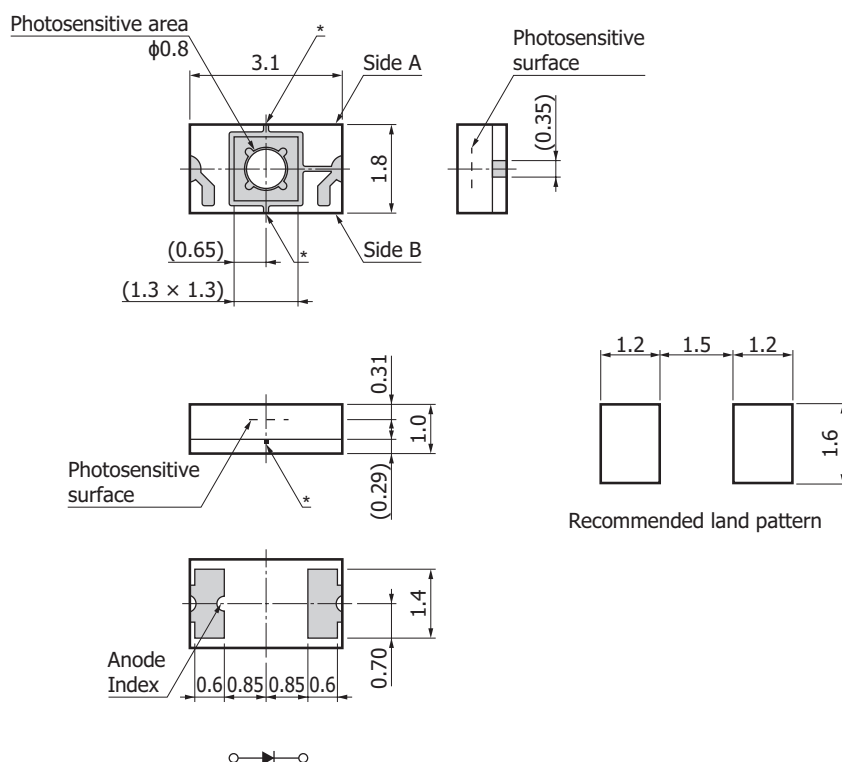


Directivity



KPINB0413EA

Dimensional outline (unit: mm)



Tolerance: ± 0.2 unless otherwise noted
 Values in parentheses indicate reference values.

* Side of the element

* There is exposed wiring on side A and side B.
 To prevent short circuits, do not allow any
 conductors to come in contact with the wiring.

Electrode

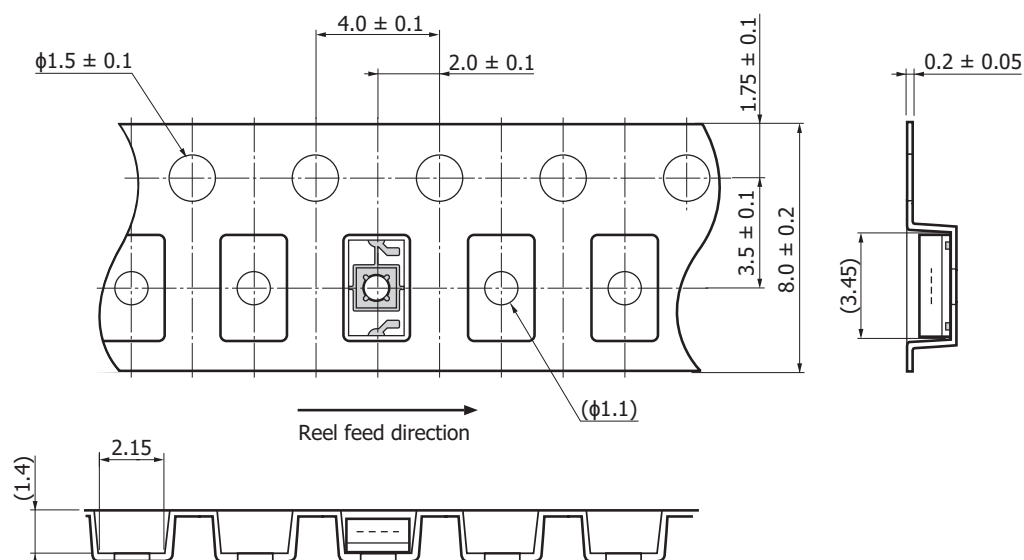
KPINAO119EB

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)



KPINC0027EA

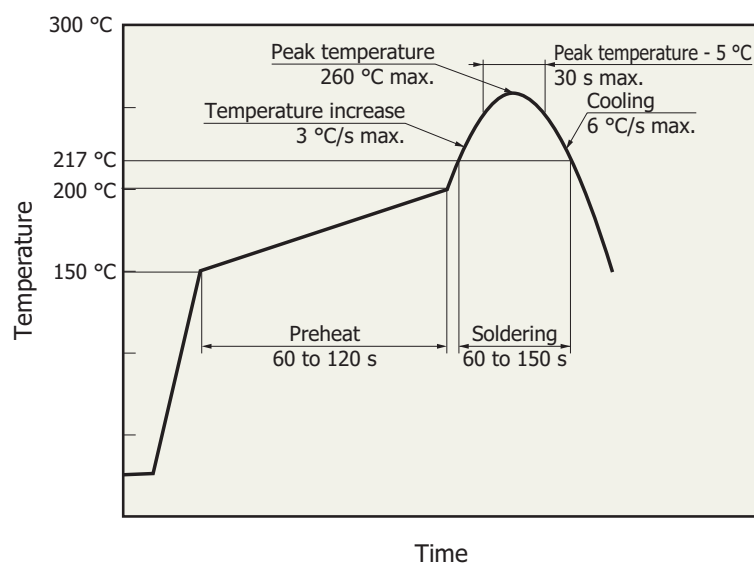
■ Packing quantity

1000 pcs/reel

■ Packing type

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

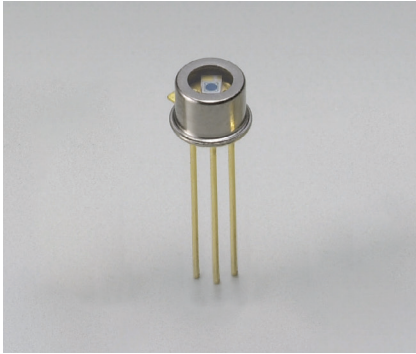
Recommended solder reflow conditions



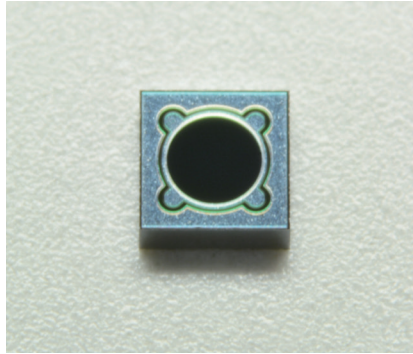
KMPDB0405EB

- 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. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Related products: Metal package, bare chip type



Metal package S5972



Bare chip type S5972-04

Similar products are available: the metal package S5972 and the bare chip type S5972-04.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

■ Precautions

- Disclaimer
- Surface mount type products

■ Technical information

- Si photodiodes / Application circuit examples

The content of this document is current as of November 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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