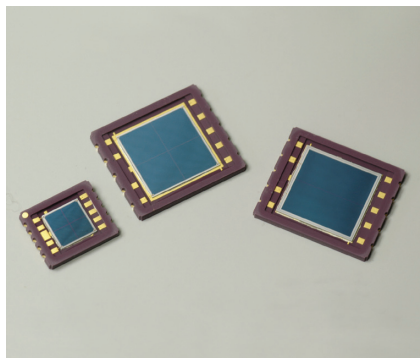


Si PIN photodiodes



S5980/S5981/S5870 series

Surface mountable, segmented type Si photodiode

Features

- Surface mount type ceramic chip carrier package
- Compatible with lead-free solder reflow
- High sensitivity
- Packing
Tray: S5980, S5981, S5870
Reel: S5980-10, S5981-10, S5870-10

Applications

- Laser optical axis alignment
- Level meter
- Pointing device, etc.

Structure

Parameter	Symbol	S5980/-10	S5981/-10	S5870/-10	Unit
Photosensitive area	A	5 × 5 / 4 segments	10 × 10 / 4 segments	10 × 10 / 2 segments	mm
Gap between elements	-	30			μm
Package	-	Ceramic			-
Window material	-	Resin coating			-

Absolute maximum ratings

Parameter	Symbol	S5980/-10	S5981/-10	S5870/-10	Unit
Reverse voltage	V _R max	30			V
Operating temperature*1	T _{opr}	-40 to +100			°C
Storage temperature*1	T _{stg}	-40 to +125			°C
Soldering temperature	T _{sol}	260 (3 times)*2			°C

*1: No dew condensation

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.

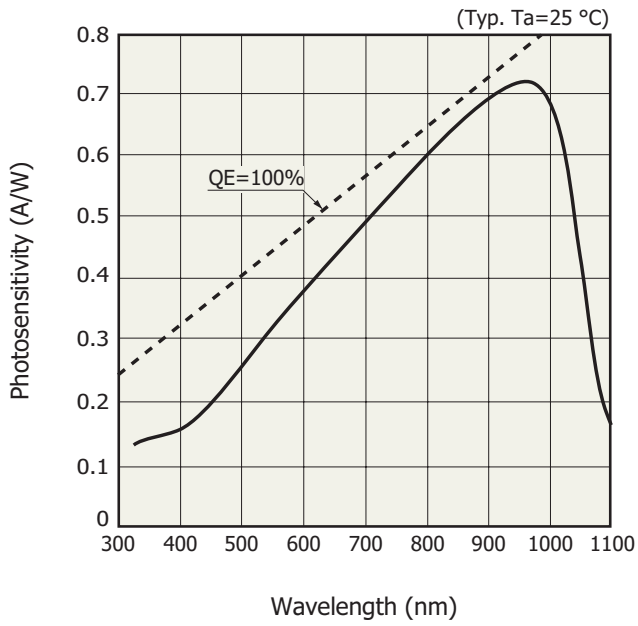
*2: Reflow soldering, JEDEC J-STD-020 MSL 3, see P.7

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, per element)

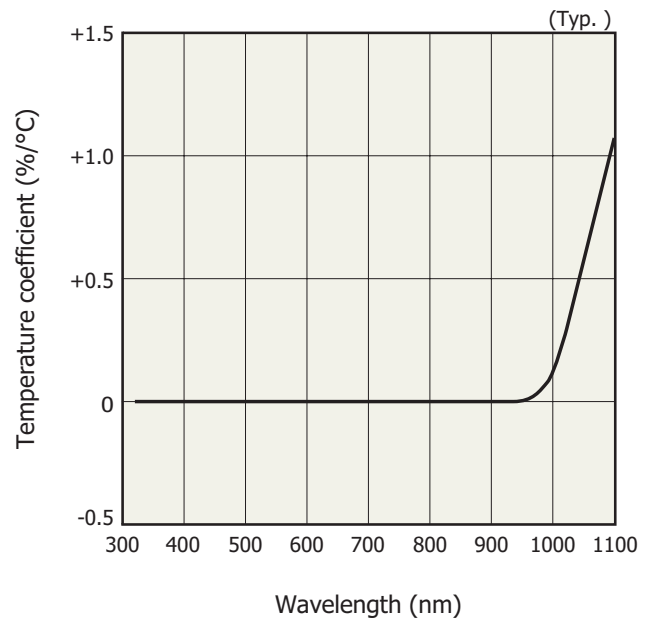
Parameter	Symbol	Condition	S5980/-10		S5981/-10		S5870/-10		Unit
			Typ.	Max.	Typ.	Max.	Typ.	Max.	
Spectral response range	λ		320 to 1100	-	320 to 1100	-	320 to 1100	-	nm
Peak sensitivity wavelength	λ _p		960	-	960	-	960	-	nm
Photosensitivity	S	λ=λ _p	0.72	-	0.72	-	0.72	-	A/W
Dark current	I _D	V _R =10 V	0.3	2	0.6	4	2	10	nA
Dark current temperature coefficient	T _{CI D}		1.15	-	1.15	-	1.15	-	times/°C
Cutoff frequency	f _c	V _R =10 V, R _L =50 Ω, -3 dB	25	-	20	-	10	-	MHz
Terminal capacitance	C _t	V _R =10 V, f=1 MHz	10	-	35	-	50	-	pF
Noise equivalent power	NEP	V _R =10 V, λ=λ _p	1.4 × 10 ⁻¹⁴	-	1.9 × 10 ⁻¹⁴	-	3.5 × 10 ⁻¹⁴	-	W/Hz ^{1/2}

Spectral response



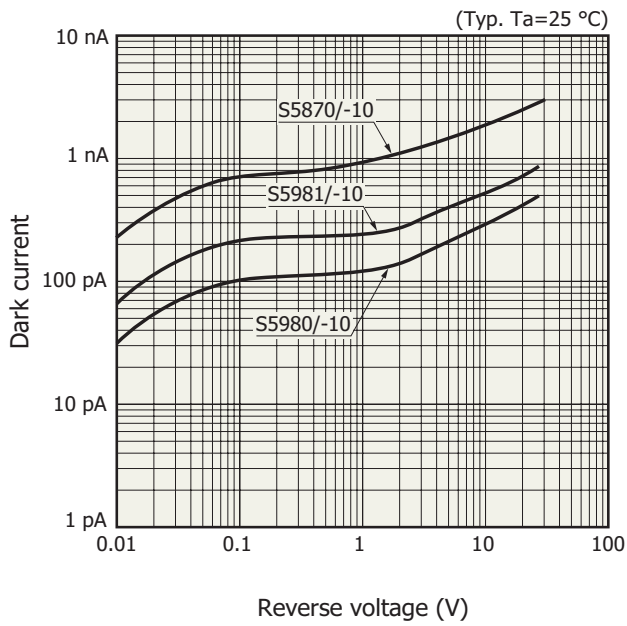
KMPDB0122EB

Sensitivity temperature characteristics



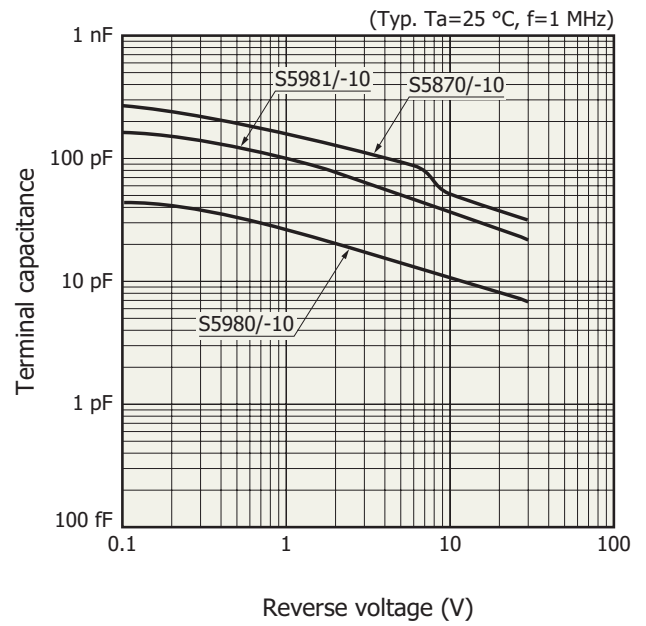
KMPDB0123EB

Dark current vs. reverse voltage



KMPDB0124EA

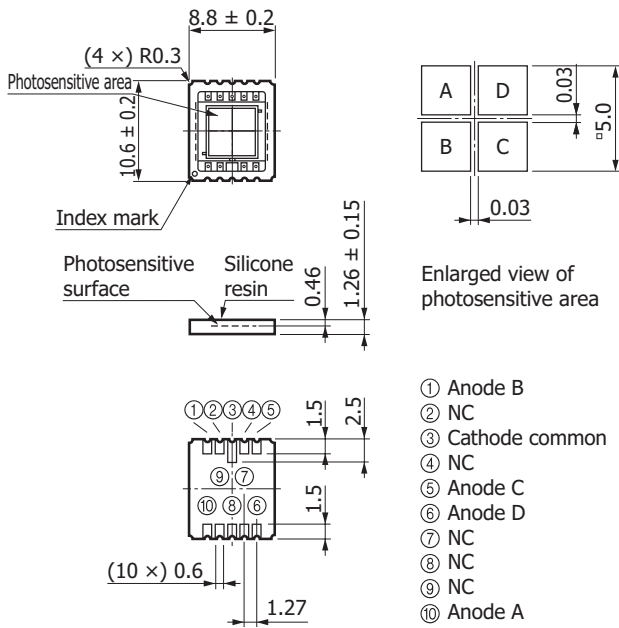
Terminal capacitance vs. reverse voltage



KMPDB0125EA

Dimensional outlines (unit: mm)

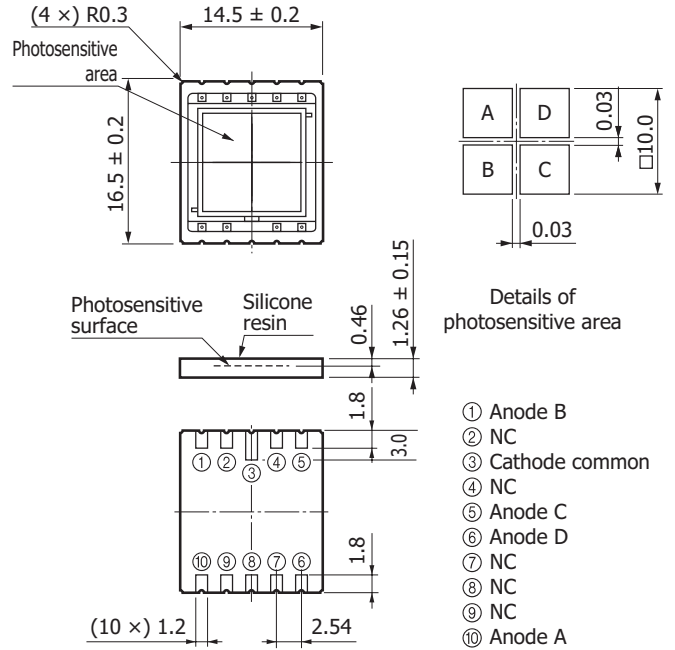
S5980/-10



Burrs shall protrude no more than 0.3 mm on any side of package.

KMPDA0036EB

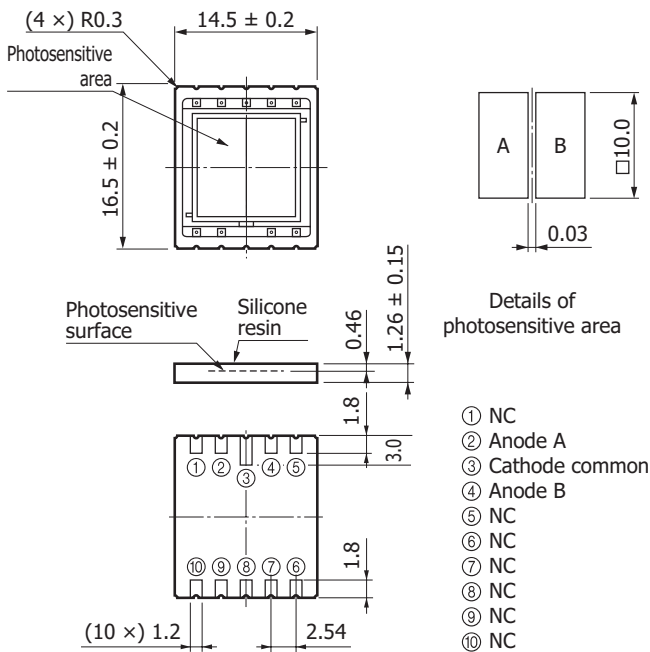
S5981/-10



Burrs shall protrude no more than 0.3 mm on any side of package.

KMPDA0037EB

S5870/-10

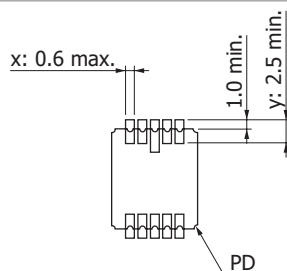


Burrs shall protrude no more than 0.3 mm on any side of package.

KMPDA0113EC

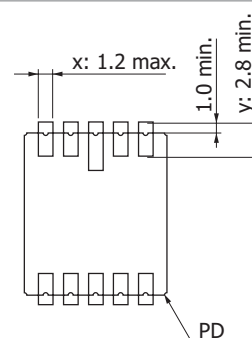
Recommended land patterns (unit: mm)

S5980/-10



KPINC0031EC

S5981/-10, S5870/-10



KPINC0032ED

1. Solder all terminals.
2. Do not make the land area larger than necessary.
3. It is preferable that the land sizes be about equal.
4. Make land width x about the same as the terminal width.
5. Make land height y at least 1 mm longer than the terminal height, protruding outside the package.

Standard packing specifications

S5980, S5981, S5870

- Packing quantity
S5980: 100 pcs max./tray
S5981, S5870: 50 pcs max./tray

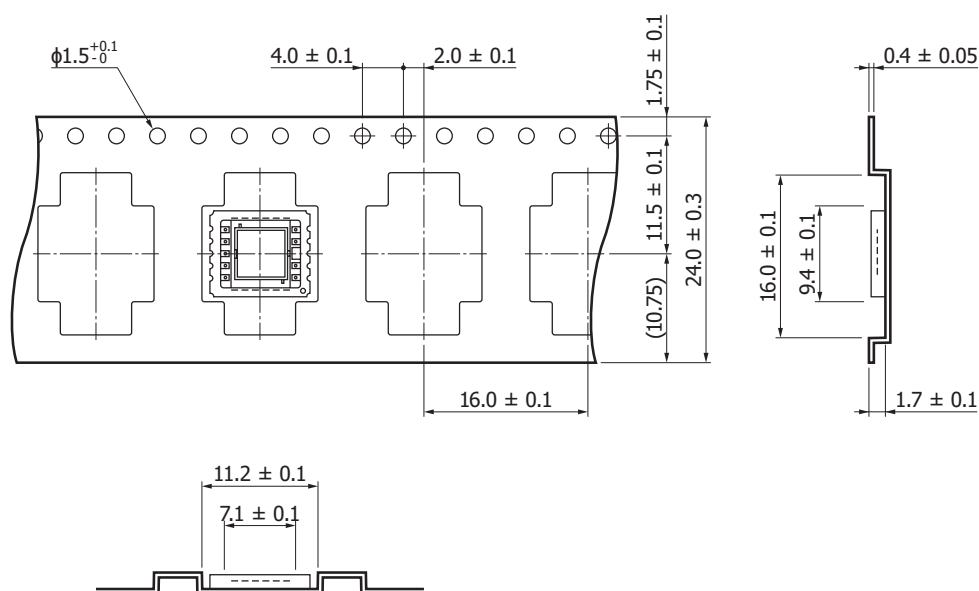
- Packing state
Tray and desiccant in moisture-proof packaging (vacuum-sealed)

S5980-10

- Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
φ254 mm	φ100 mm	24 mm	PS	Conductive

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



KPINC0036EA

- Packing quantity
1000 pcs/reel

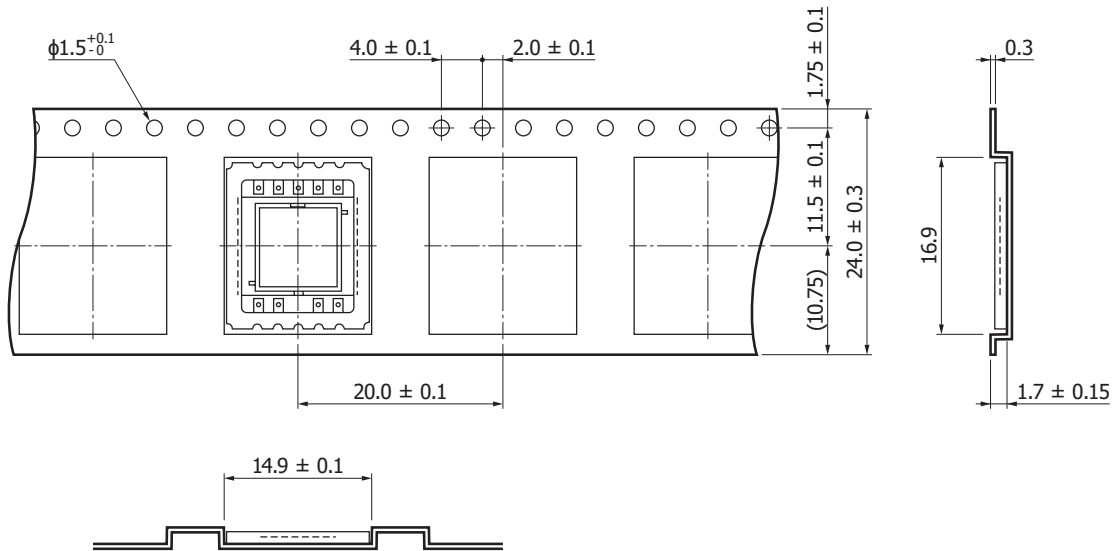
- Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S5870-10, S5981-10

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
φ330 mm	φ80 mm	24 mm	PS	Conductive

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



KPINC0037EA

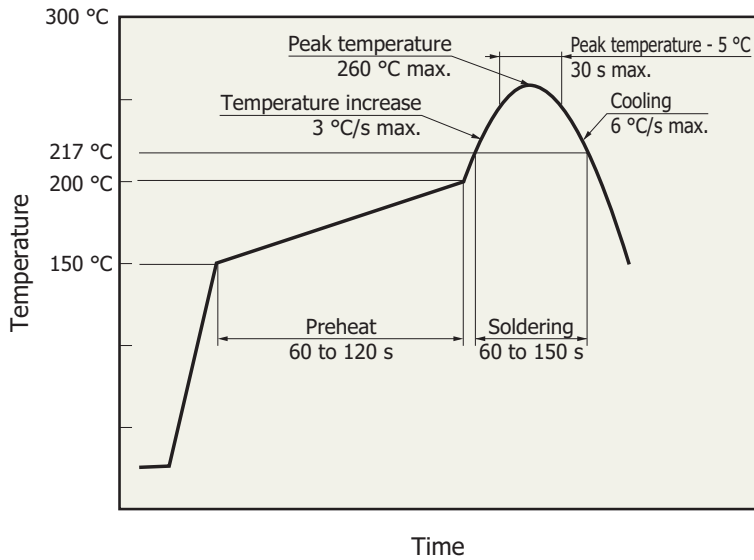
■ Packing quantity

100 pcs/reel

■ Packing state

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

Recommended reflow soldering conditions



KMPDB0405EB

Precautions

- This product's light input window uses soft silicone resin. Stain or scratch in the light input window degrades the sensitivity. Avoid contact with the light input window, as applying external force to the resin surface may cause the wire to deform and break.
- When soldering, use rosin-based flux to prevent terminal corrosion. Solder at 260 °C or less within 5 seconds without moisture absorption. Check carefully the conditions of reflow soldering, since they vary depending on the board and reflow oven in use.
- Silicone resin swells with organic solvents. So do not use anything other than alcohol.
- Avoid opening the bag until immediately before using the product so as to prevent oxidation or contamination of terminals or moisture absorption of resin filling.

In addition, if 3 months have passed in an unopened state or 168 hours have passed after opening, bake in nitrogen atmosphere for 3 to 5 hours at 150 °C, or for 12 to 15 hours at 120 °C before use.

Related information

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.

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