

Si PIN photodiodes

S5106/S5107/S7509/S7510 series

Surface mountable, high-speed response Si PIN photodiodes

The S5106, S5107, S7509, and S7510 are Si PIN photodiodes sealed in surface mountable chip carrier packages. They can be mounted using solder reflow, which facilitates automation. Since the photosensitive area is large, they are suitable for FSO (free space optics) and other applications that require a wide field of view. In addition, they can be used in a wide variety of applications including POS, measurements, and analysis.

Features

- Surface mount type ceramic chip carrier package
- Compatible with lead-free solder reflow
- High sensitivity, high-speed response
- Packing
Tray: S5106, S5107, S7509, S7510
Reel: S5106-10, S5107-10, S7509-10, S7510-10

Applications

- FSO
- Laser radars
- Power meters
- Barcode readers

Structure

Type no.	Photosensitive area (mm)	Package	Window material
S5106/-10	5 × 5	Ceramic	Silicone resin
S5107/-10	10 × 10		
S7509/-10	2 × 10		
S7510/-10	6 × 11		

Absolute maximum ratings

Type no.	Reverse voltage V_R (V)	Power dissipation P (mW)	Operating temperature T_{opr}^{*1} (°C)	Storage temperature T_{stg}^{*1} (°C)	Soldering temperature T_{sol}^{*1} (°C)
S5106/-10	30	50	-40 to +100	-40 to +125	260 (3 times) ^{*2}
S5107/-10					
S7509/-10					
S7510/-10					

*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.

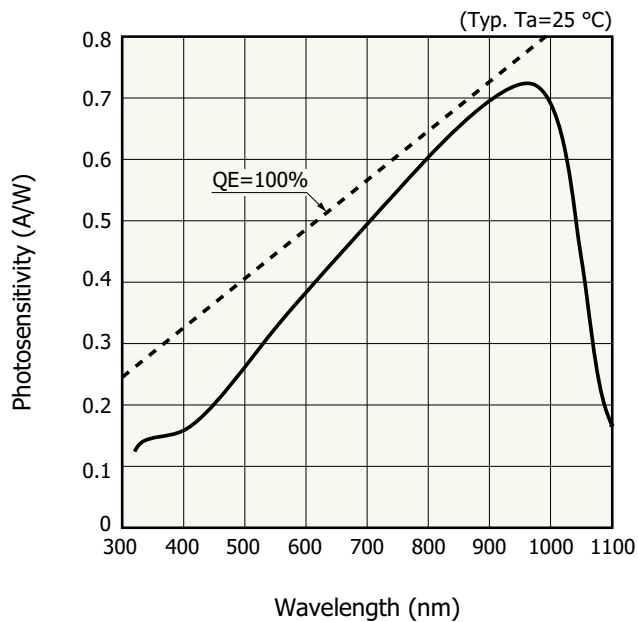
*2: Reflow soldering, JEDEC J-STD-020 MSL 3, see P.9

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 (Typ. Ta=25 °C, unless otherwise noted)

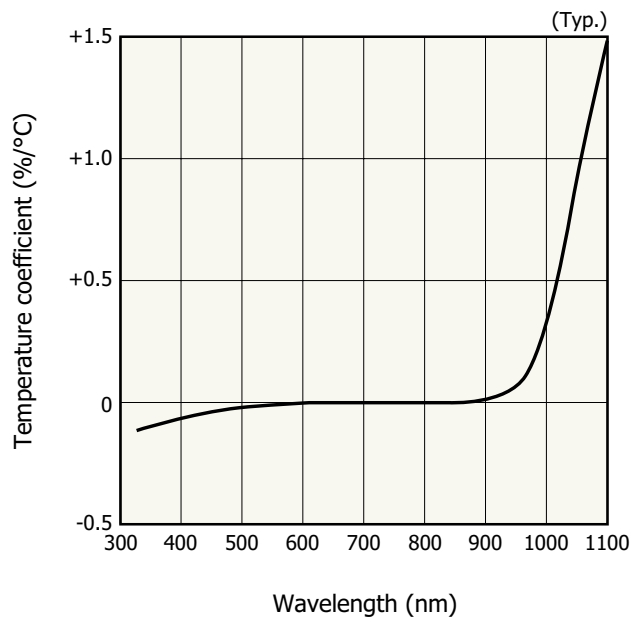
Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photosensitivity S (A/W)				Short circuit current Isc 100 lx (μ A)	Dark current Id VR=10 V		Dark current temperature coefficient TCID (times/°C)	Cutoff frequency fc RL=50 Ω VR=10 V (MHz)	Terminal capacitance Ct f=1 MHz VR=10 V (pF)	NEP VR=10 V $\lambda=\lambda_p$ (W/Hz ^{1/2})
			λ_p	660 nm	780 nm	830 nm		Typ. (nA)	Max. (nA)				
S5106/-10	320 to 1100	960	0.72	0.45	0.57	0.62	27	0.4	5	1.15	20	40	1.6×10^{-14}
S5107/-10							110	0.9	10		10	150	2.4×10^{-14}
S7509/-10							22	0.5	5		20	40	1.7×10^{-14}
S7510/-10							72	1.0	10		15	80	2.5×10^{-14}

Spectral response



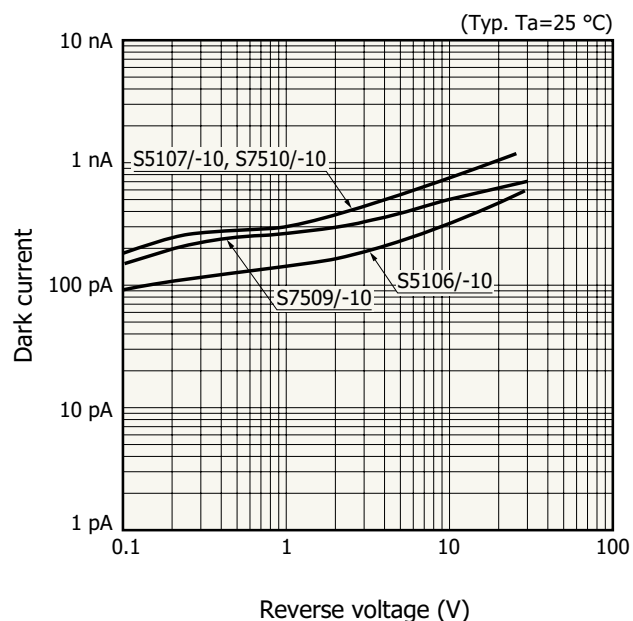
KPINB0165EB

Sensitivity temperature characteristics



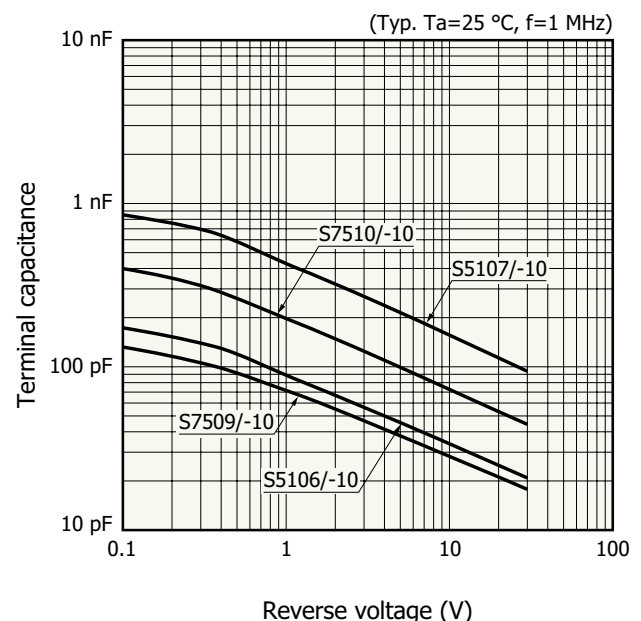
KPINB0452ECA

Dark current vs. reverse voltage



KPINB0166EA

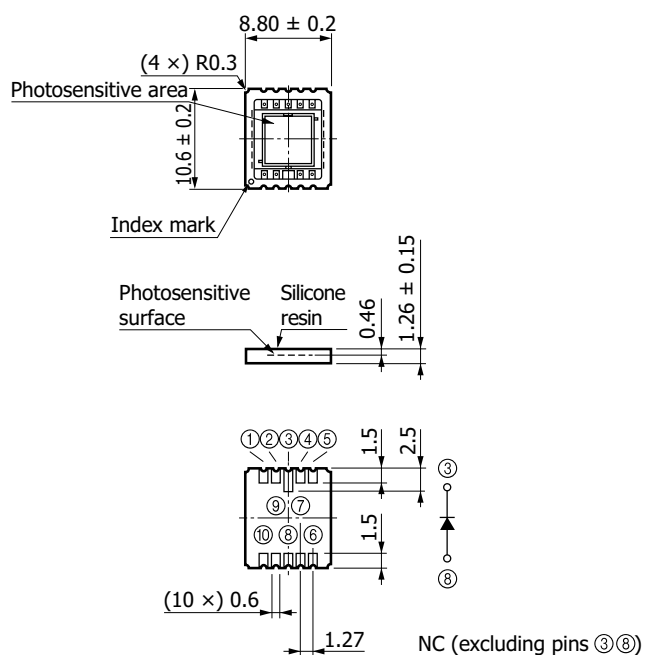
Terminal capacitance vs. reverse voltage



KPINB0128EB

Dimensional outlines (unit: mm)

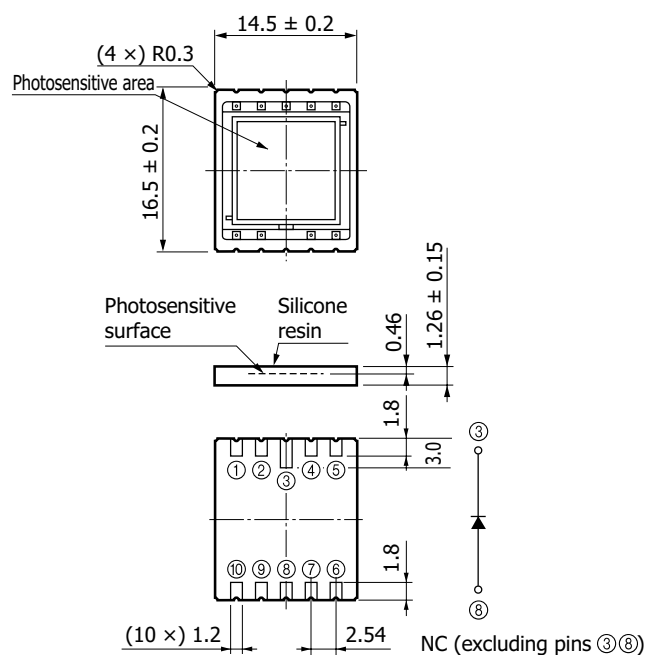
S5106/-10



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

KPINA0002EF

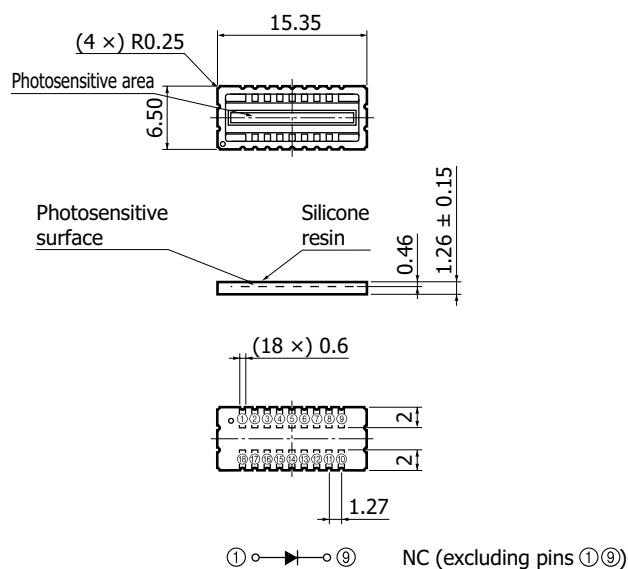
S5107/-10



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

KPINA0013ED

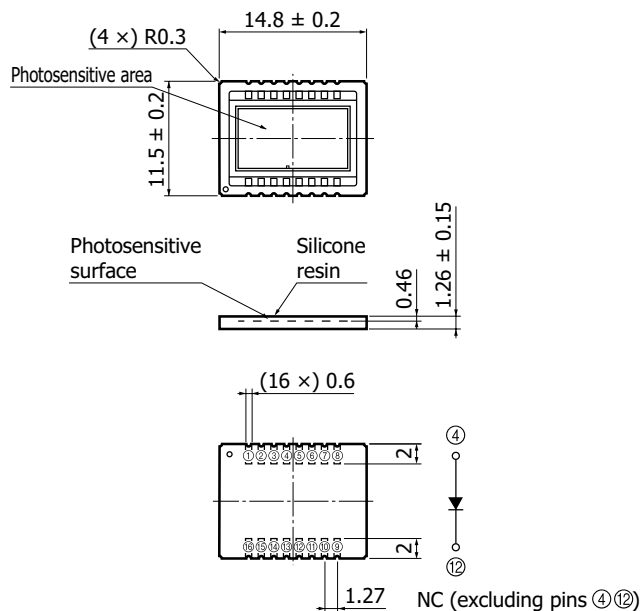
S7509/-10



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

KPINA0055EB

S7510/-10

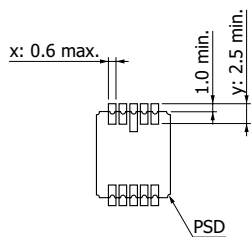


Burrs shall protrude no more than 0.3 mm on any side of package.

KPINA0056EB

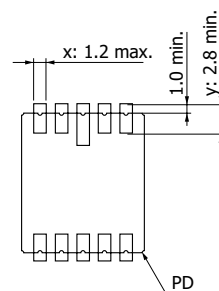
Recommended land patterns (unit: mm)

S5106/-10



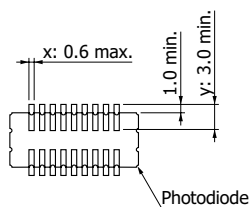
KPINC0031EB

S5107/-10



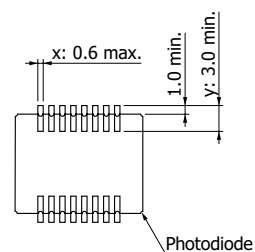
KPINC0032ED

S7509/-10



KPINC0028EC

S7510/-10



KPINC0033EB

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

S5106, S5107, S7509, S7510

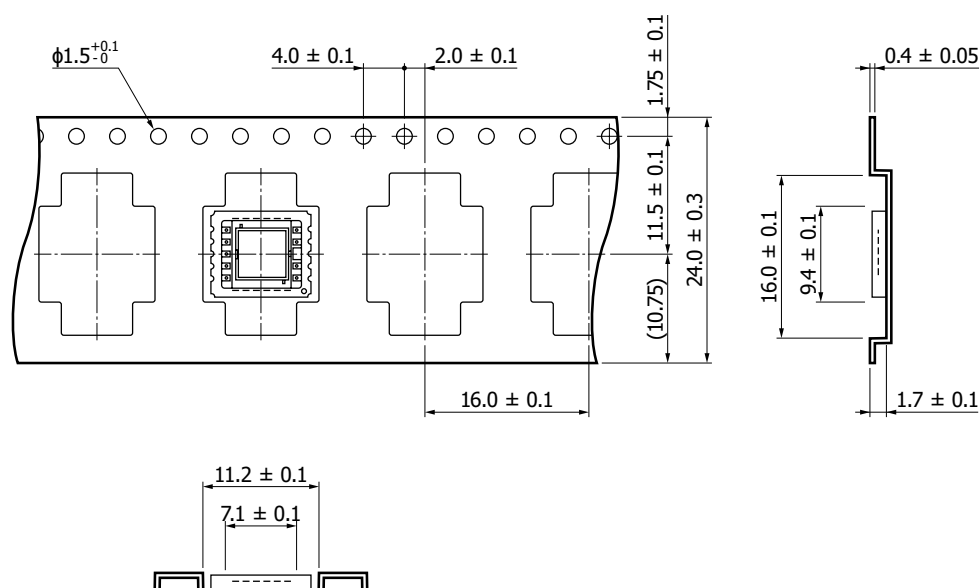
- Packing quantity
S5106, S7509: 100 pcs max./tray
S5107, S7510: 50 pcs max./tray
- Packing state
Tray and desiccant in moisture-proof packaging (vacuum-sealed)

S5106-10

- 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

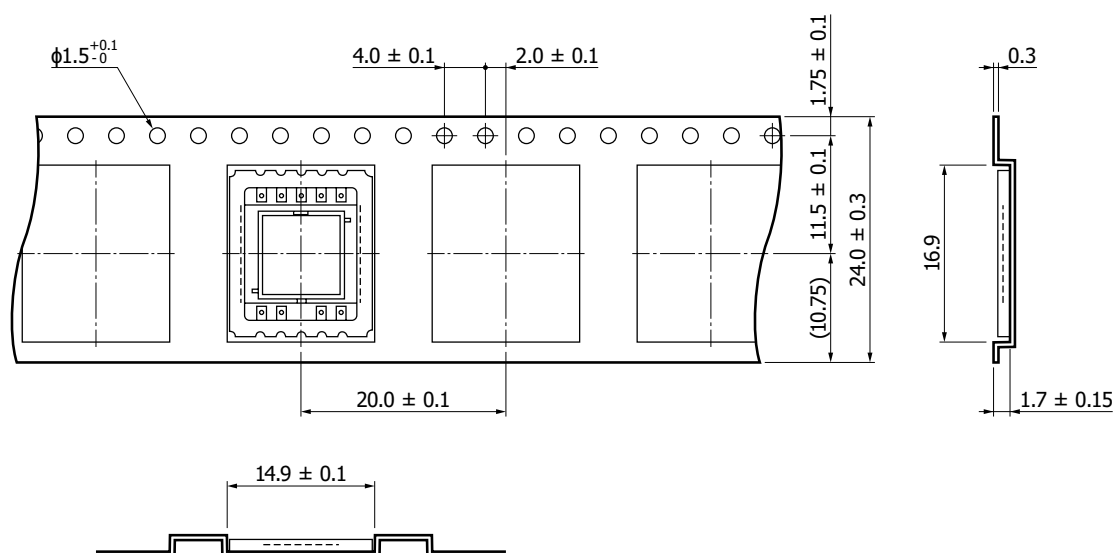
- Packing quantity
1000 pcs/reel
- Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S5107-10

■ 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

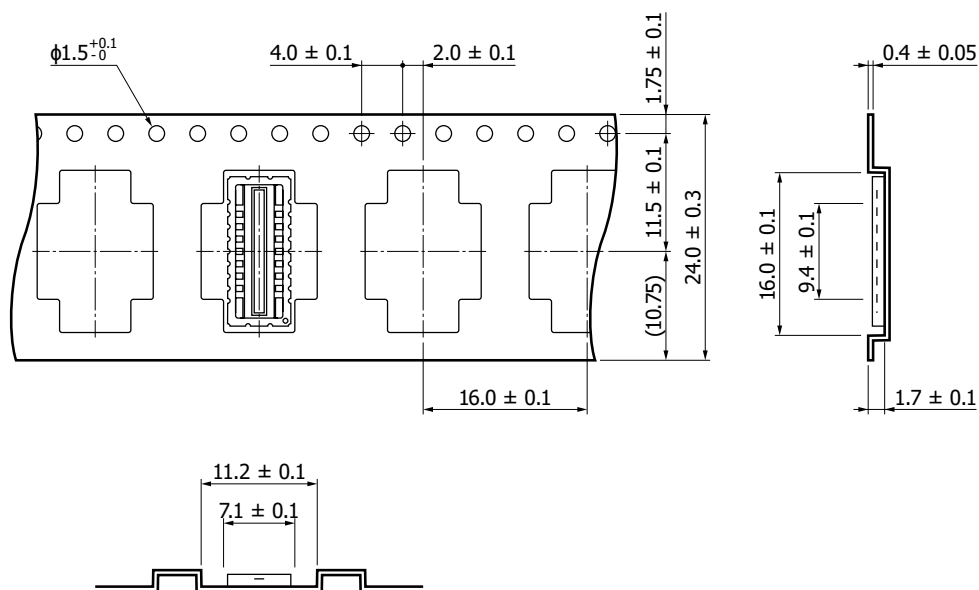
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S7509-10

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
$\phi 254$ mm	$\phi 100$ mm	24 mm	PS	Conductive

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



KPINC0038EA

■ Packing quantity

1000 pcs/reel

■ Packing state

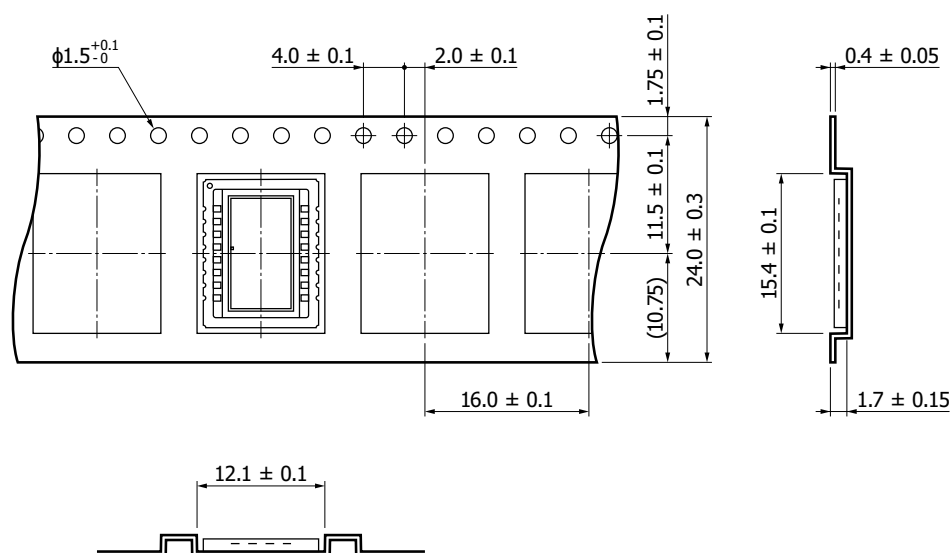
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S7510-10

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
$\phi 254$ mm	$\phi 100$ mm	24 mm	PS	Conductive

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



KPINC0039EA

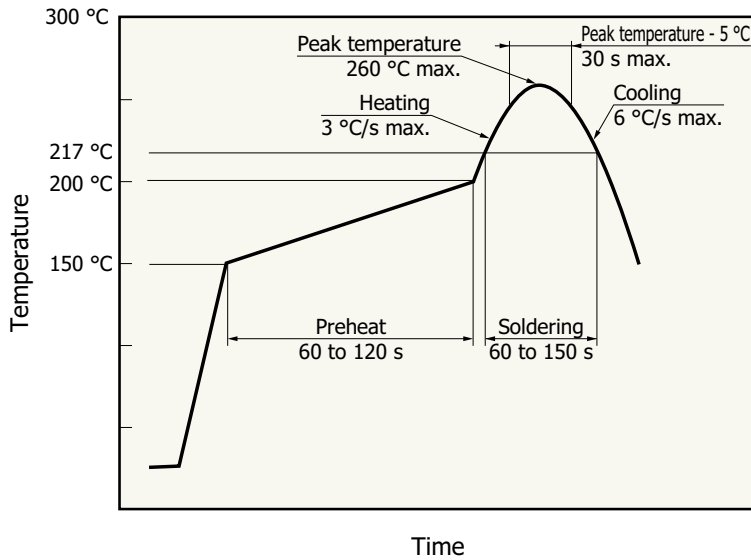
■ Packing quantity

100 pcs/reel

■ Packing state

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

Recommended reflow soldering conditions



KMPDB0405EC

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.
- 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.
- 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 12 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
- Precautions / Surface mount type products

■ Catalogs

- Technical note / Si photodiodes

Information described in this material is current as of November 2024.

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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