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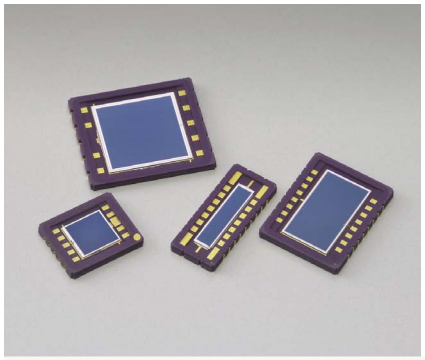
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Si PIN photodiodes



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

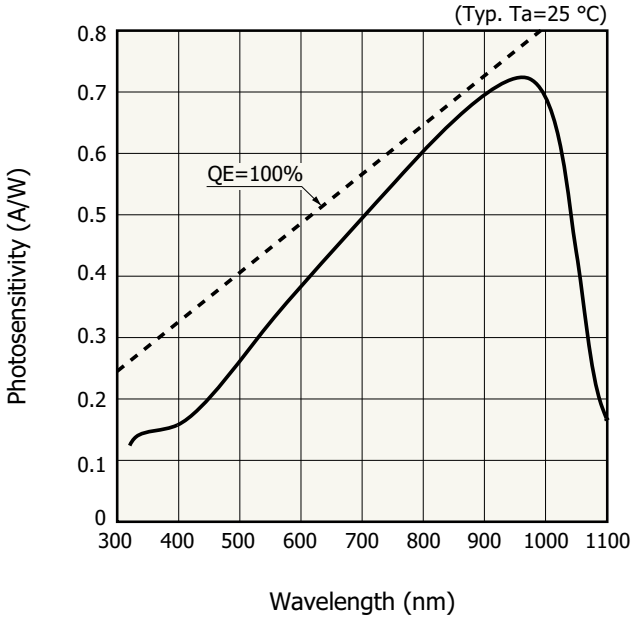
Type no.	Reverse voltage V_R (V)	Power dissipation P (mW)	Operating temperature Topr*1 (°C)	Storage temperature Tstg*1 (°C)	Soldering temperature Tsol*1 (°C)
S5106/-10	30	50	-40 to +100	-40 to +125	260 (3 times)*2
S5107/-10					
S7509/-10					
S7510/-10					

*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)

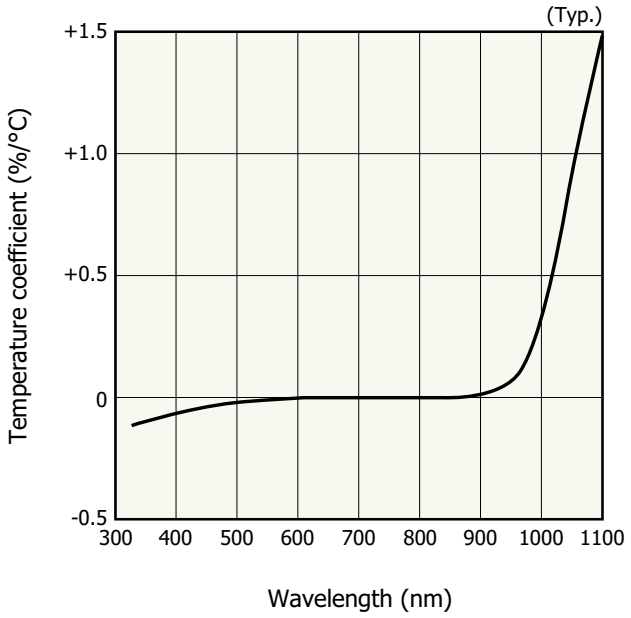
Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λp (nm)	Photosensitivity S (A/W) λp	660 nm	780 nm	830 nm	Short circuit current Isc 100 lx (μA)	Dark current ID VR=10 V Typ. (nA)	Max. (nA)	Dark current temperature coefficient TCID (times/°C)	Cutoff frequency fc RL=50 Ω VR=10 V (MHz)	Terminal capacitance Ct f=1 MHz VR=10 V (pF)	NEP VR=10 V λ=λp (W/Hz$^{1/2}$)
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



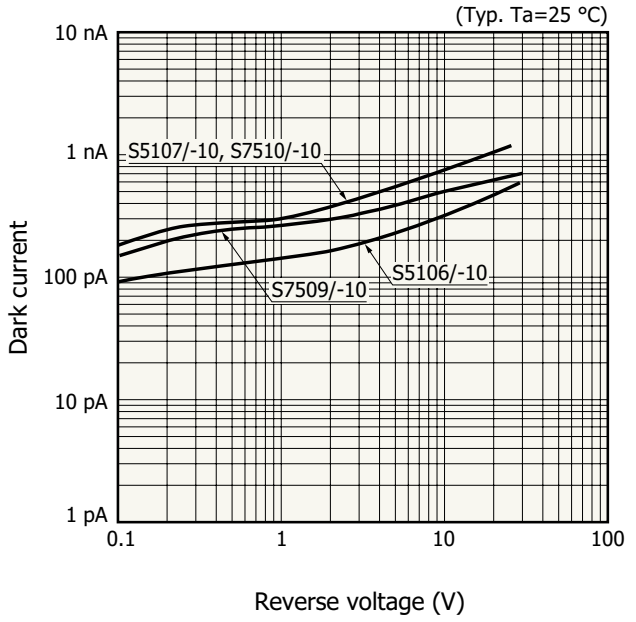
KPINB0165EB

Sensitivity temperature characteristics



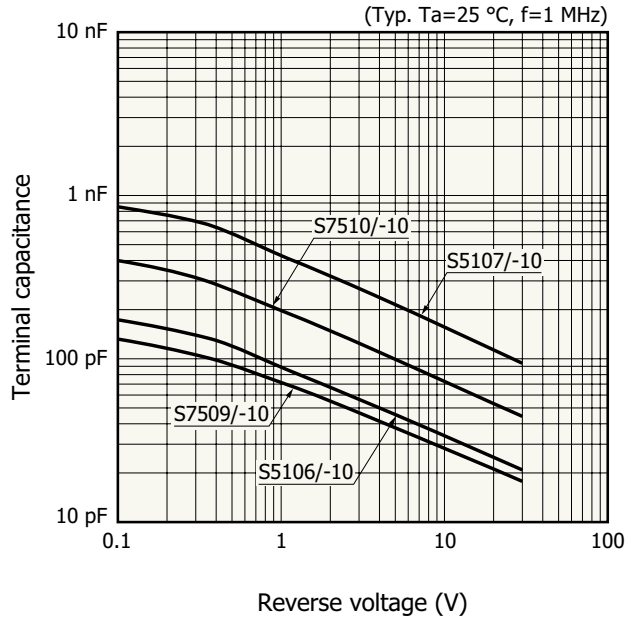
KPINB0452ECA

Dark current vs. reverse voltage



KPINB0166EA

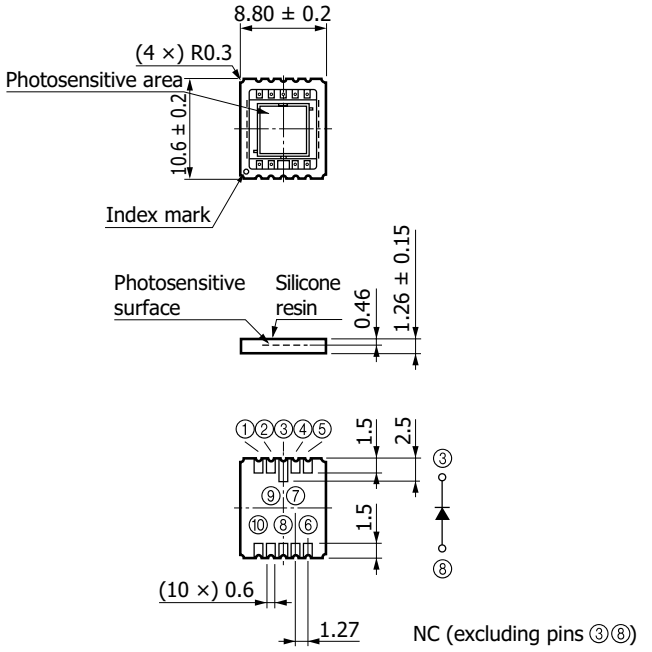
Terminal capacitance vs. reverse voltage



KPINB0128EB

Dimensional outlines (unit: mm)

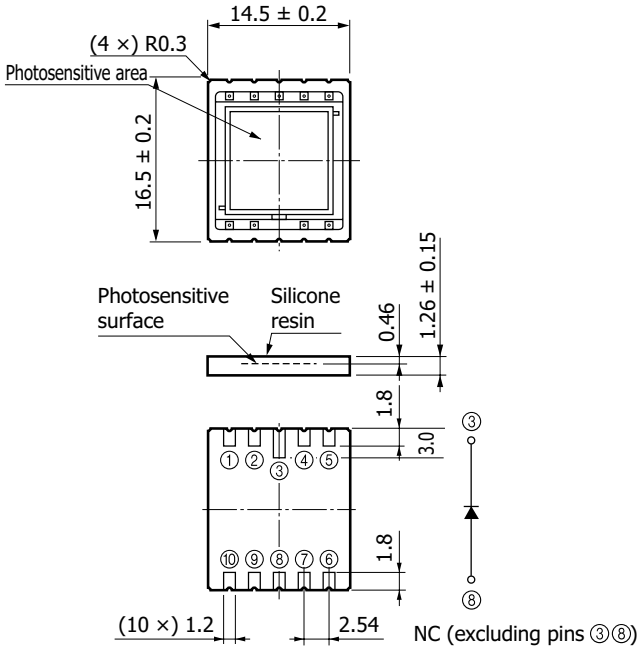
S5106/-10



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

KPINA0002EF

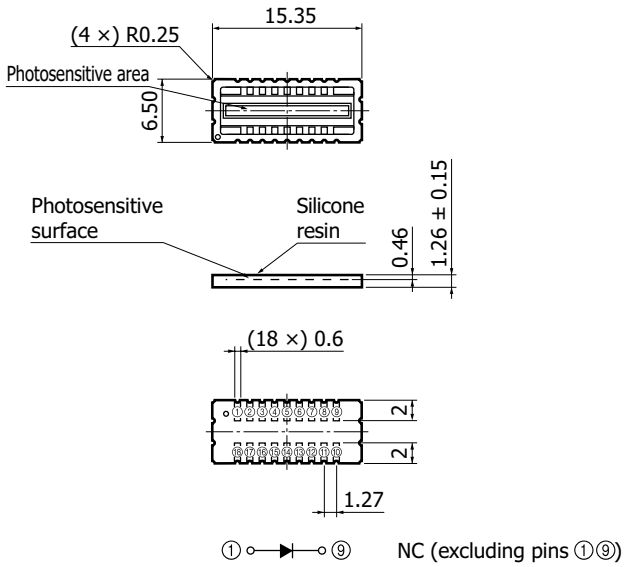
S5107/-10



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

KPINA0013ED

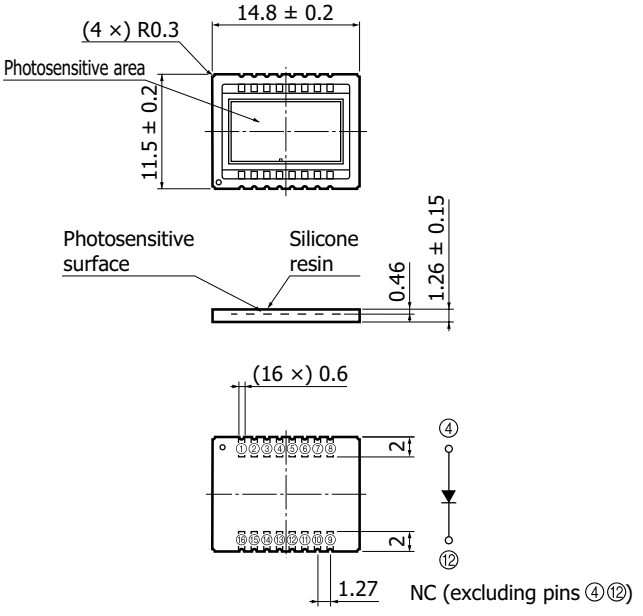
S7509/-10



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

KPINA0055EB

S7510/-10

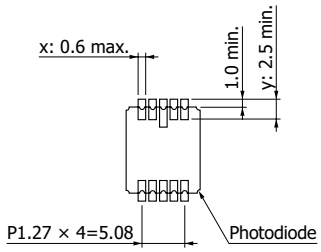


Burrs shall protrude no more than 0.3 mm on any side of package.

KPINA0056EB

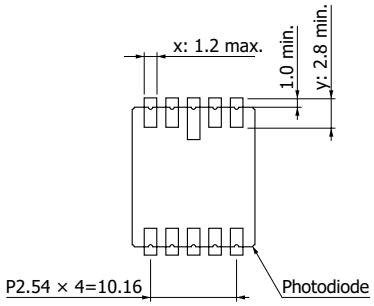
Recommended land patterns (unit: mm)

S5106/-10



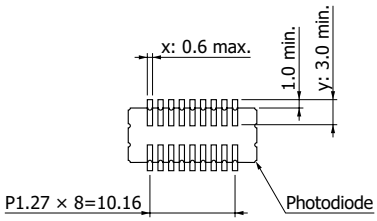
KPINC0031ED

S5107/-10



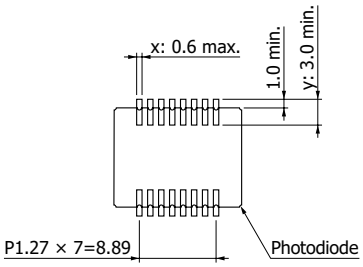
KPINC0032EE

S7509/-10



KPINC0028ED

S7510/-10



KPINC0033EC

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

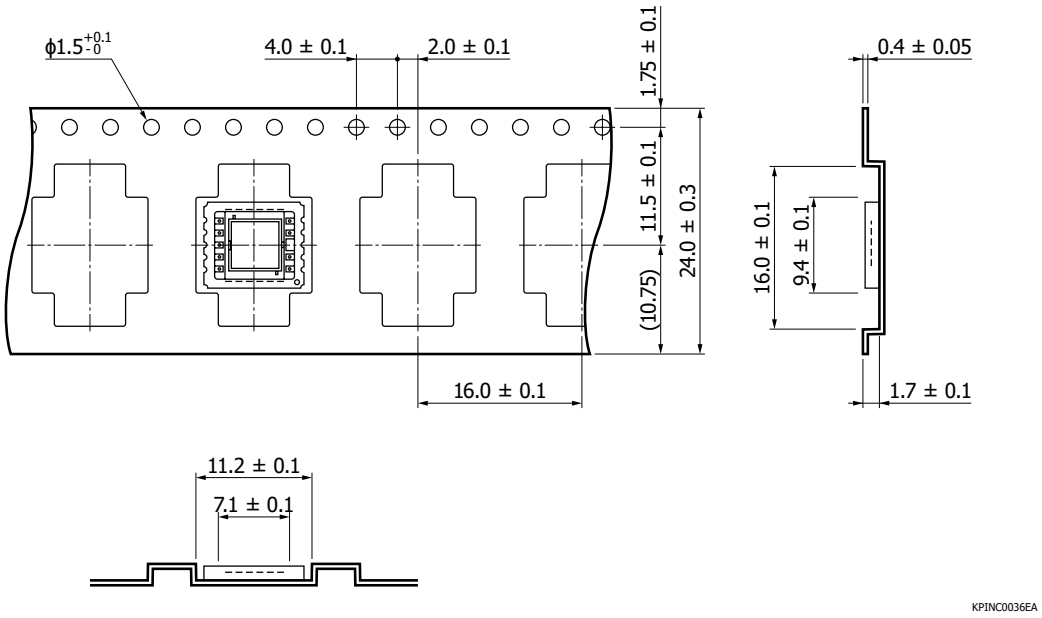
- Packing state
  Tray and desiccant in moisture-proof packaging (vacuum-sealed)

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)



- Packing quantity
  1000 pcs/reel

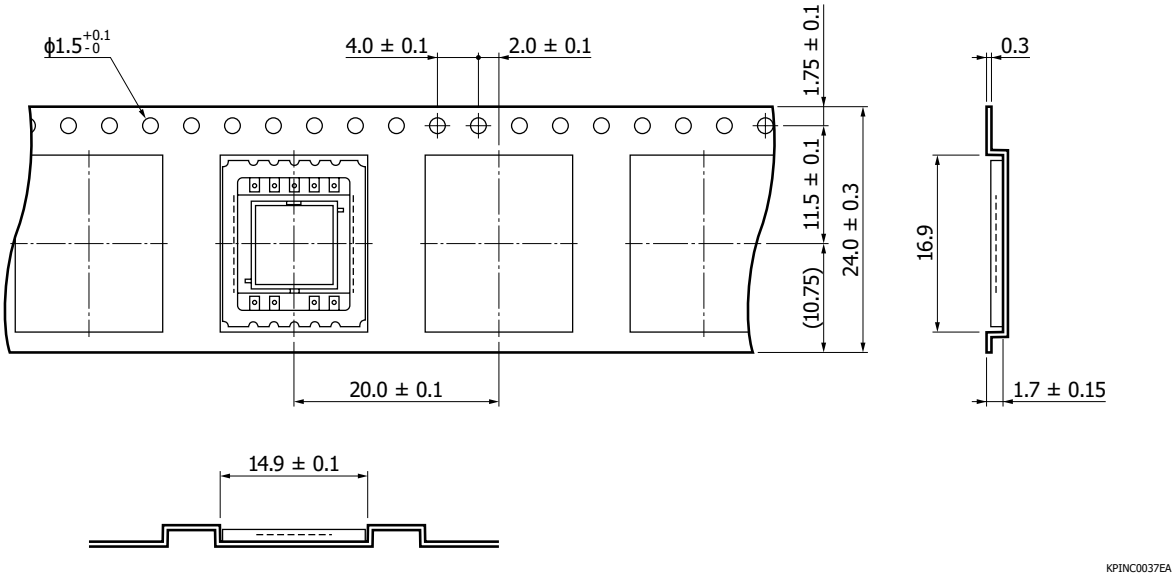
- Packing state
  Reel and desiccant in moisture-proof packaging (vacuum-sealed)

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)



■ Packing quantity
100 pcs/reel

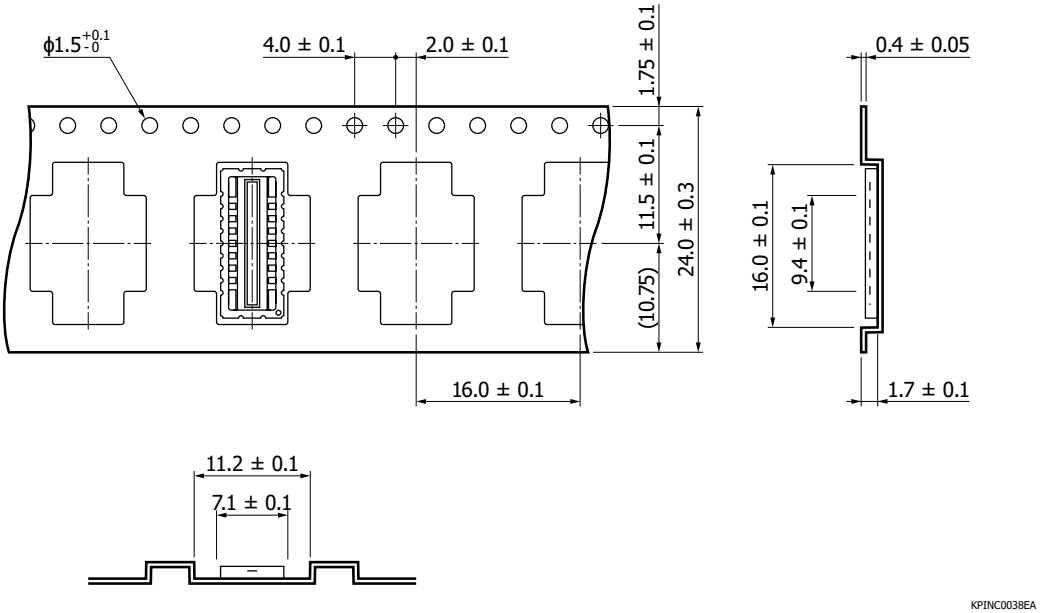
■ Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S7509-10

■ Reel (conforms to JEITA ET-7200)

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

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



■ Packing quantity
1000 pcs/reel

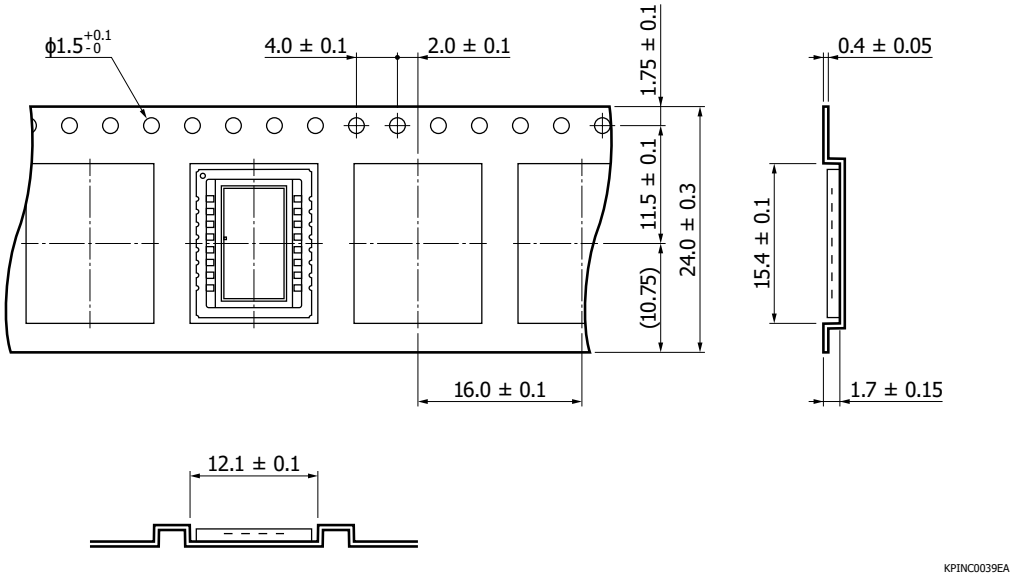
■ Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

S7510-10

■ Reel (conforms to JEITA ET-7200)

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

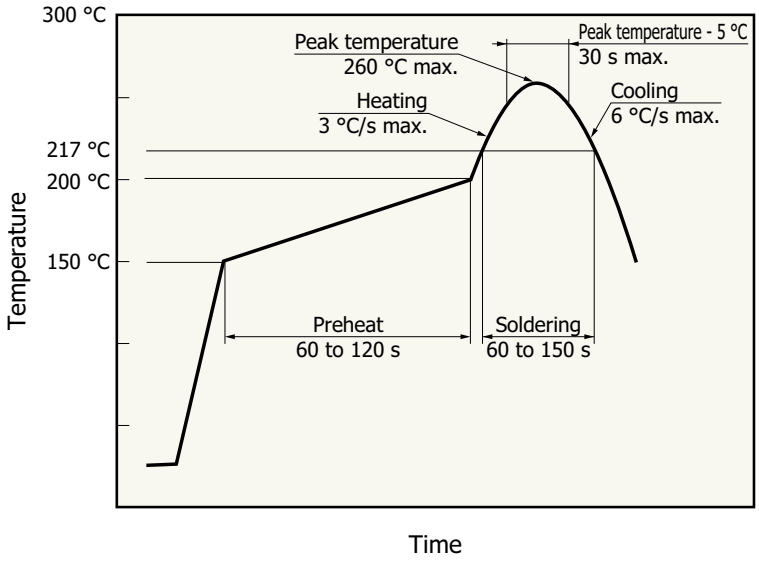
■ Embossed tape (unit: mm, material: PS, conductive)



■ Packing quantity
100 pcs/reel

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

Recommended reflow soldering conditions



KMPDB0405EC

- After unpacking, store in an environment at a temperature of 30 °C or less and a humidity 60% or less, and perform reflow soldering within 168 hours.
- 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.

Baking

If more than 12 months have passed in the unopened state, or storage conditions are exceeded after opening the package, baking is required to remove moisture before reflow soldering. For the baking, refer to "Precautions / Surface mount type products" in the related information.

■ Recommended baking conditions

Temperature: 150 °C (3 to 5 hours) or 120 °C (12 to 15 hours)
Note: Before setting the baking conditions, perform experiments to confirm that no problems occur with the product.

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 December 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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