

S9981-01CT

Applicable to lead-free solder reflow and wide temperature range

The S9981-01CT is a photodiode that is applicable to lead-free solder reflow and has an extremely wide operating and storage temperature range (-40 to +125 °C). The small and thin leadless package allows reducing the mount area on a printed circuit board.

Features

- Compatible with lead-free reflow soldering
- Surface mount type, compact, thin leadless package
- Operating/storage temperature: -40 to +125 °C
- Photosensitive area: 1.3 × 1.3 mm
- High sensitivity: 0.65 A/W ($\lambda=960$ nm)

Applications

- Raindrop detection
- Sunlight detection and the like

Structure

Parameter	Specification	Unit
Photosensitive area	1.3 × 1.3	mm
Package	Glass epoxy	-
Seal material	Silicone resin	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R max.	$T_a=25$ °C	10	V
Operating temperature	T_{opr}	No dew condensation*1	-40 to +125	°C
Storage temperature	T_{stg}	No dew condensation*1	-40 to +125	°C
Reflow soldering conditions	T_{sol}	JEDEC MSL 4	Peak temperature: 250 °C, twice (see P.5)	-

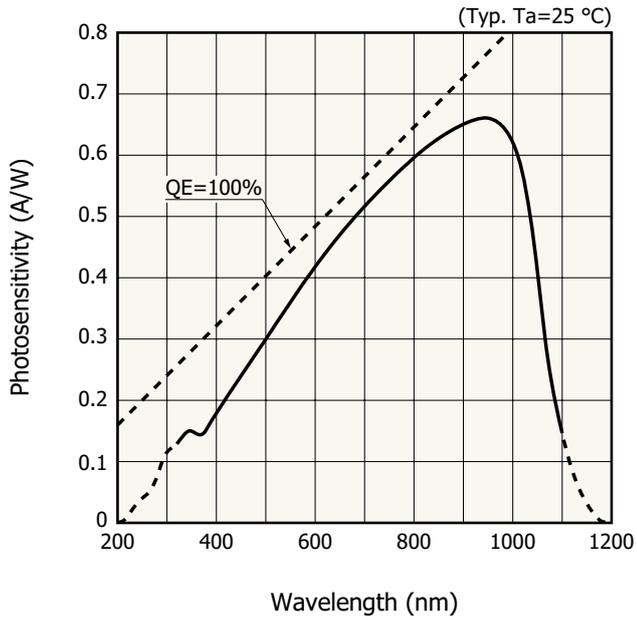
*1: When there is a temperature difference between a product and the surrounding area in high temperature environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

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)

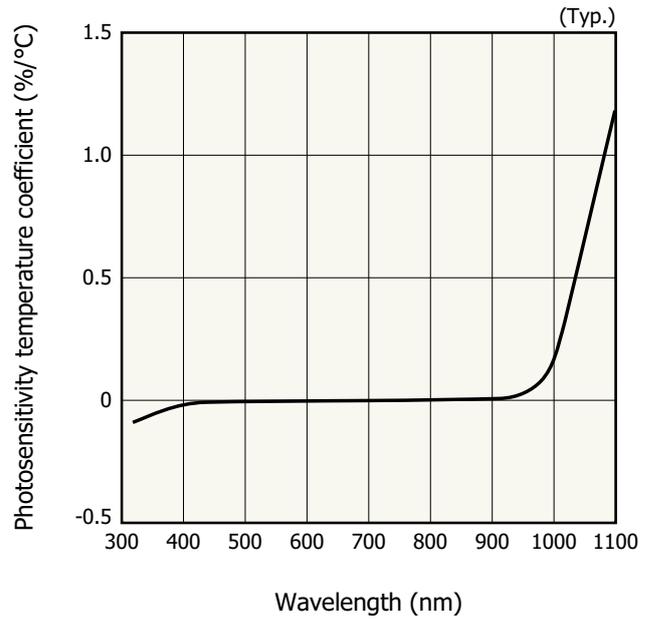
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	320 to 1100	-	nm
Peak sensitivity wavelength	λ_p		-	960	-	nm
Photosensitivity	S	$\lambda=\lambda_p$	0.55	0.65	-	A/W
Short circuit current	I_{sc}	100 lx, 2856 K	-	1.65	-	μ A
Temperature coefficient of short circuit current	-		-	+0.1	-	%/°C
Half-power angle	-		-	± 60	-	degrees
Dark current	I_D	$V_R=5$ V	-	0.01	1	nA
Temperature coefficient of dark current	T_{CID}		-	1.12	-	times/°C
Rise time	t_r	$V_R=0$ V, $R_L=1$ k Ω 10 to 90%	-	0.5	-	μ s
Terminal capacitance	C_t	$V_R=0$ V, $f=10$ kHz	-	200	400	pF

Spectral response



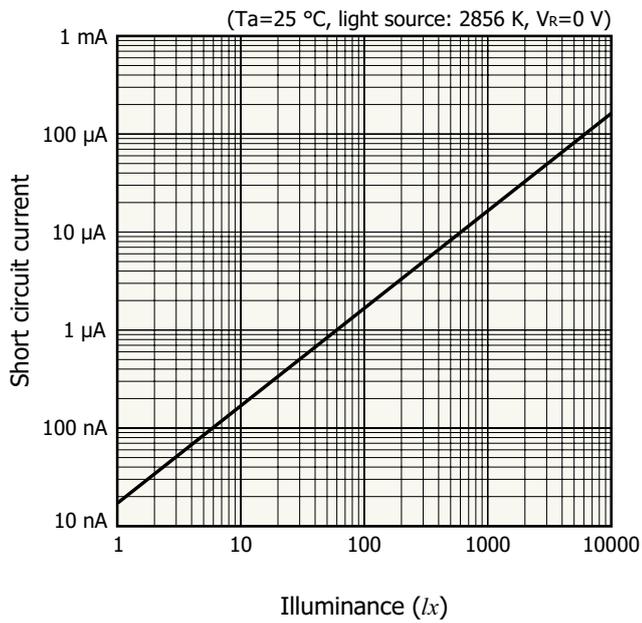
KSPDB0385EA

Photosensitivity temperature characteristics



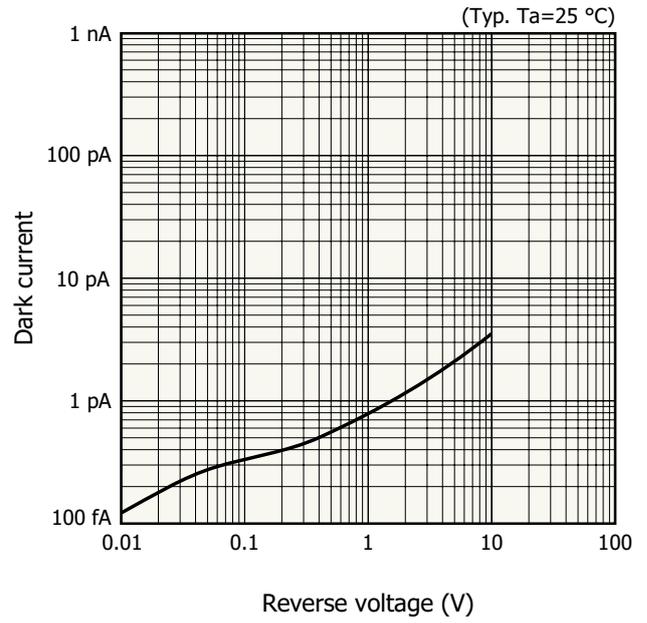
KSPDB0322EB

Linearity



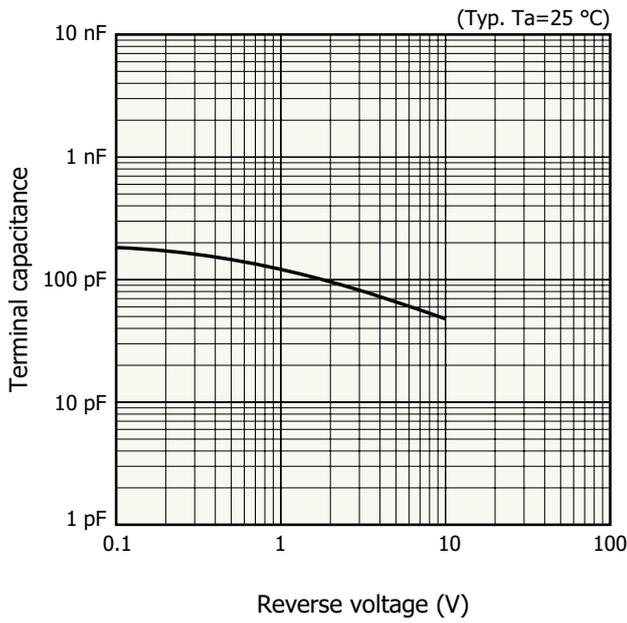
KSPDB0386EA

Dark current vs. reverse voltage

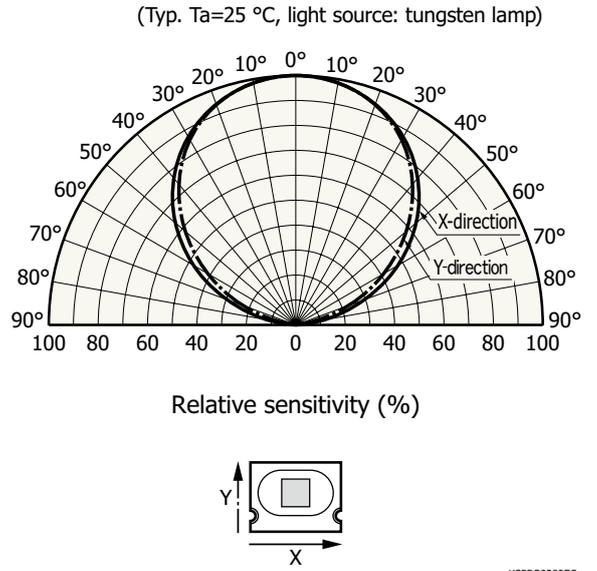


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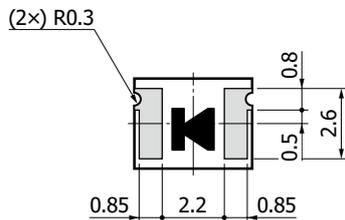
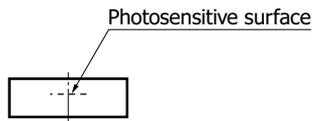
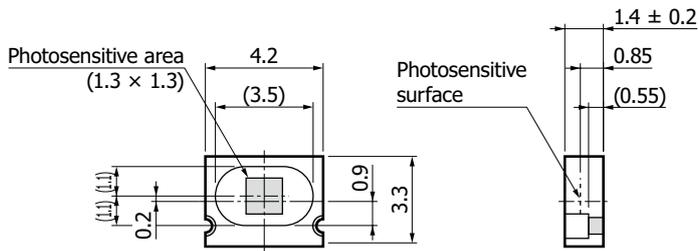
Terminal capacitance vs. reverse voltage



Directivity



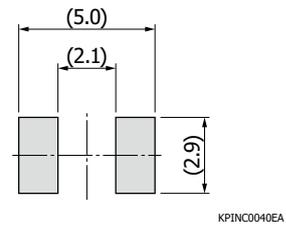
Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ±0.15, ±2°
 Chip position accuracy:
 with respect to package center
 $X \leq \pm 0.2$, $Y \leq \pm 0.2$, $\theta \leq \pm 2^\circ$

KSPDA0218EA

Recommended land pattern

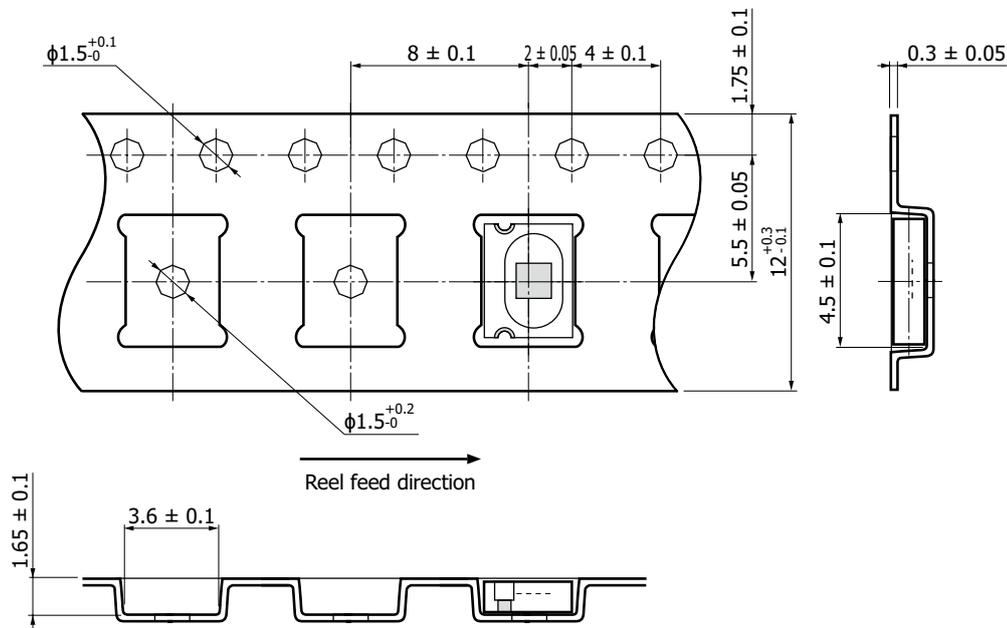


Standard packing specifications

- Reel (conforms to JEITA ET-7200)

Reel outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
254 mm	100 mm	12 mm	Polystyrene	Conductive

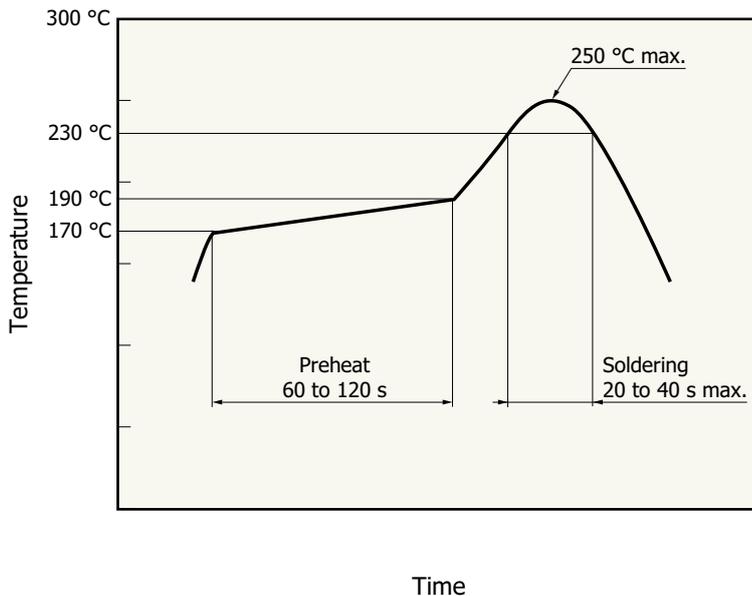
- Embossed tape (unit: mm, material: polystyrene, conductive)



KSPDC0096EA

- Packing quantity
2000 pcs/reel
- Packing type
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

Recommended reflow soldering conditions



KPINB0440EA

- 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 72 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.

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 March 2023.

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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