

S15289-33

High UV resistant and back-illuminated Si photodiode with CSP structure

The S15289-33 is a back-illuminated type Si photodiode that has achieved high reliability for monitoring ultraviolet light. It exhibits low sensitivity deterioration under UV light irradiation and is suitable for applications such as monitoring intense UV light sources. It is designed with minimal dead space around the product. This makes it possible to arrange multiple products side by side.

Features

- High sensitivity in UV region: QE=75% ($\lambda=200$ nm)
- High reliability in UV light irradiation
- Compatible with lead-free solder reflow

Applications

- Light level monitor for UV light source
- Analytical instruments
- Optical measurement equipment

Structure

Parameter	Specification	Unit
Package size	3 × 3	mm
Chip size	2.8 × 2.8	mm
Photosensitive area	2.5 × 2.5	mm
Package	Glass epoxy	-
Window material	None	-

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R		10	V
Operating temperature	T_{opr}	No dew condensation*1	-20 to +60	°C
Storage temperature	T_{stg}	No dew condensation*1	-20 to +80	°C
Soldering temperature	T_{sol}		240 (3 times)*2	°C

*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.

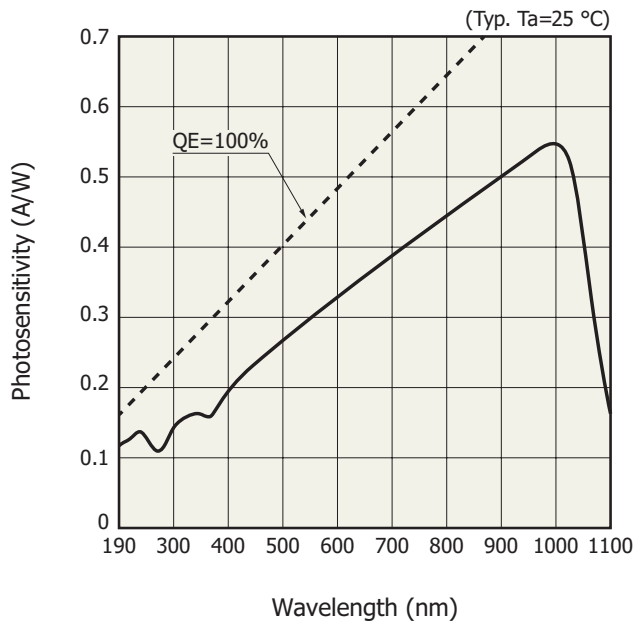
*2: Reflow soldering, JEDEC J-STD-020 MSL 5a, see P.4

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.

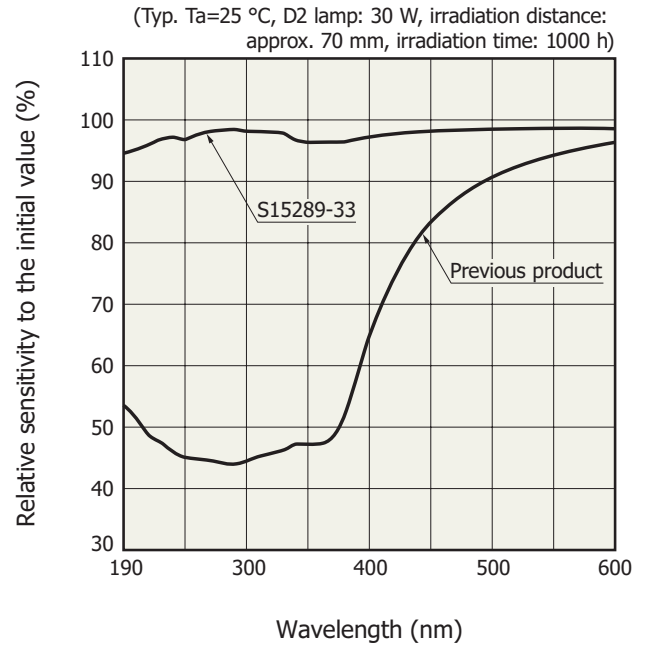
Electrical and optical characteristics ($T_a=25$ °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	190 to 1100	-	nm
Peak sensitivity wavelength	λ_p		-	1000	-	nm
Photosensitivity	S	$\lambda=\lambda_p$ $\lambda=200$ nm	- 0.1	0.54 0.12	-	A/W
Short circuit current	I_{sc}	2856 K, 100 lx	3.0	4.4	-	μ A
Dark current	I_D	$V_R=10$ mV	-	10	300	pA
Temperature coefficient of I_D	ΔT_{ID}	$V_R=10$ mV	-	1.15	-	times/°C
Rise time	t_r	$V_R=0$ V, $R_L=1$ k Ω $\lambda=409$ nm, 10 to 90%	-	30	-	μ s
Terminal capacitance	C_t	$V_R=0$ V, $f=10$ kHz	-	70	100	pF
Shunt resistance	R_{sh}	$V_R=10$ mV	0.033	1	-	G Ω
Noise equivalent power	NEP	$V_R=0$ V, $\lambda=\lambda_p$	-	7.6×10^{-15}	-	W/Hz ^{1/2}

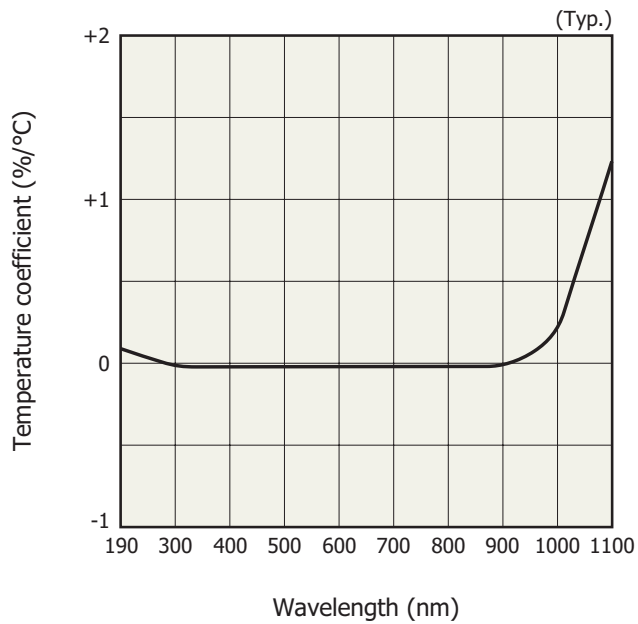
Spectral response



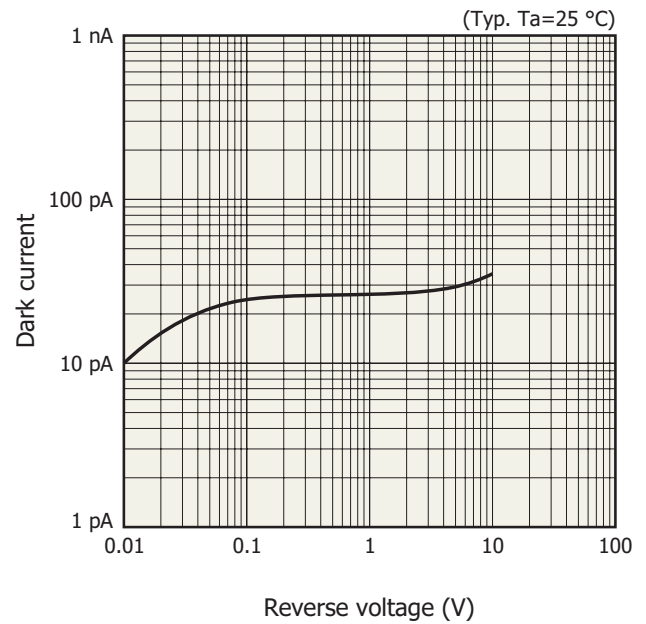
Changes to spectral sensitivity due to UV light irradiation



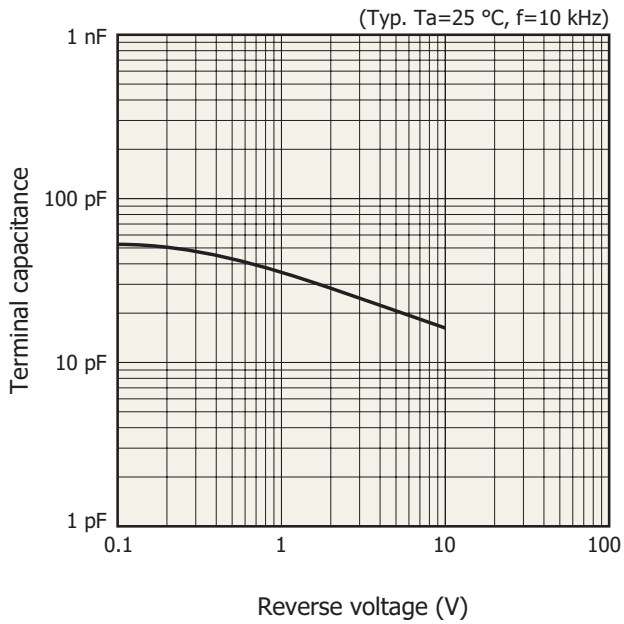
Sensitivity temperature characteristics



Dark current vs. reverse voltage

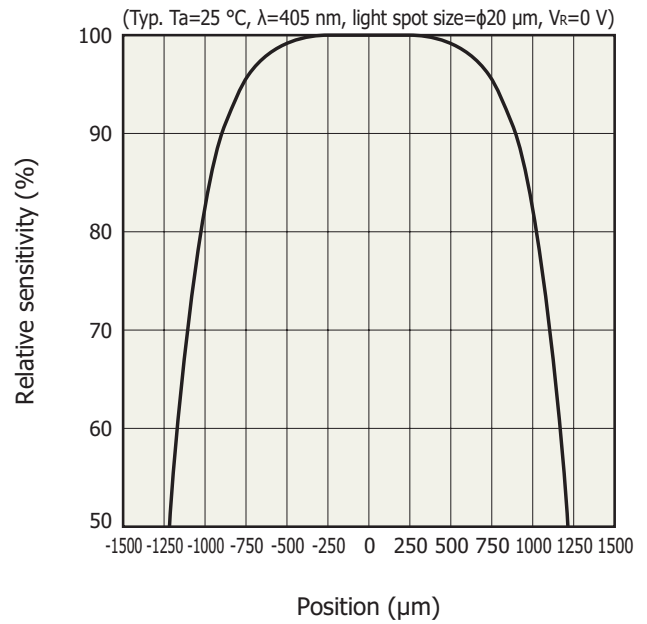


Terminal capacitance vs. reverse voltage



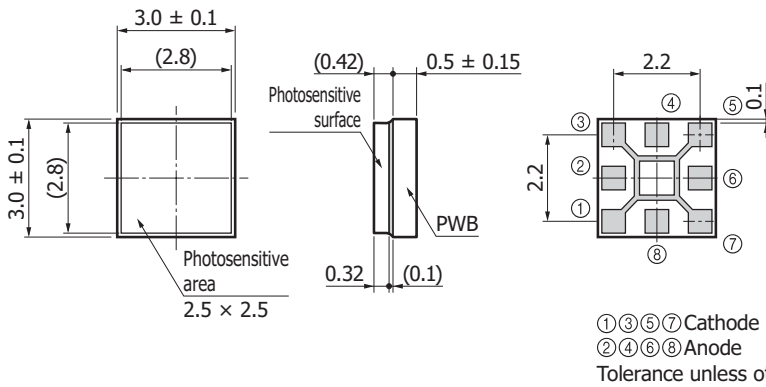
KSPDB0398EA

Sensitivity uniformity



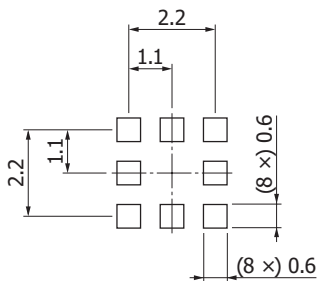
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Dimensional outline (unit: mm)



KSPDA0222EA

Recommended land pattern (unit: mm)

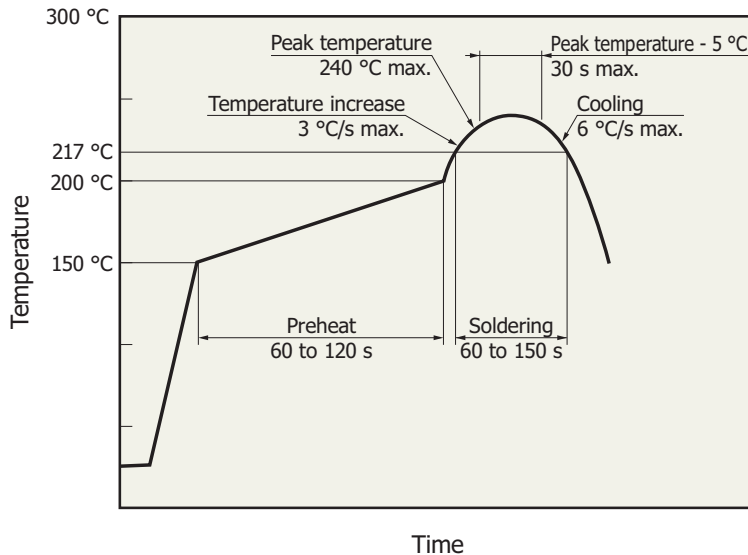


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Precautions against UV light exposure

- When UV light irradiation is applied, the product characteristics may degrade. Such examples include degradation of the product's UV sensitivity and increase in dark current. This phenomenon varies depending on the irradiation level, irradiation intensity, operating time, and operating environment and also varies depending on the product model. Before employing the product, we recommend that you check the tolerance under the ultraviolet light environment that the product will be used in.

Recommended reflow soldering conditions



- After unpacking, store it in an environment at 30 °C or less and a humidity of 60% or less, and perform soldering within 24 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.

KSPDB0400EA

Related information

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

Precautions

- Disclaimer
- Unsealed products

Technical information

- Si photodiodes / Technical note

Information described in this material is current as of March 2022.

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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