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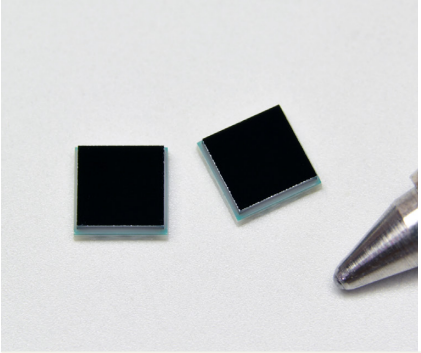
Si photodiode



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% (λ=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

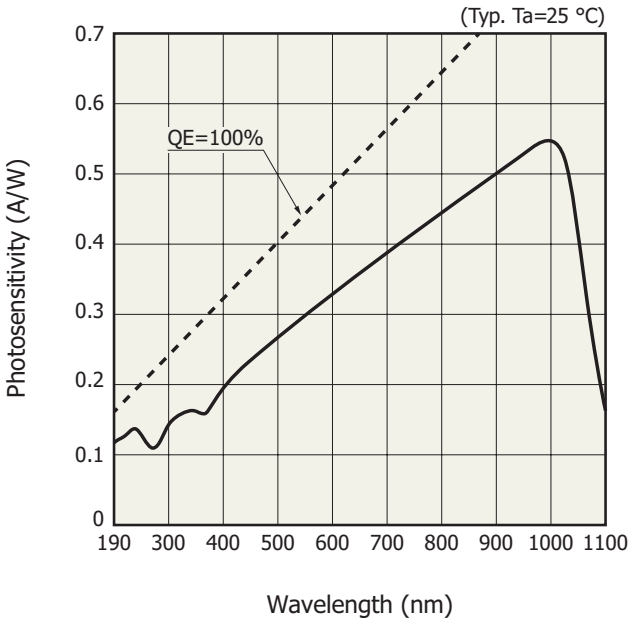
Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R		10	V
Operating temperature	Topr	No dew condensation*1	-20 to +60	°C
Storage temperature	Tstg	No dew condensation*1	-20 to +80	°C
Soldering temperature	Tsol		240 (3 times)*2	°C

*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 (Ta=25 °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	190 to 1100	-	nm
Peak sensitivity wavelength	λp		-	1000	-	nm
Photosensitivity	S	λ=λp	-	0.54	-	A/W
		λ=200 nm	0.1	0.12	-	
Short circuit current	Isc	2856 K, 100 *lx*	3.0	4.4	-	μA
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	tr	V_R=0 V, R_L=1 kΩ λ=409 nm, 10 to 90%	-	30	-	μs
Terminal capacitance	Ct	V_R=0 V, f=10 kHz	-	70	100	pF
Shunt resistance	Rsh	V_R=10 mV	0.033	1	-	GΩ
Noise equivalent power	NEP	V_R=0 V, λ=λp	-	7.6×10^{-15}	-	$W/Hz^{1/2}$

Spectral response



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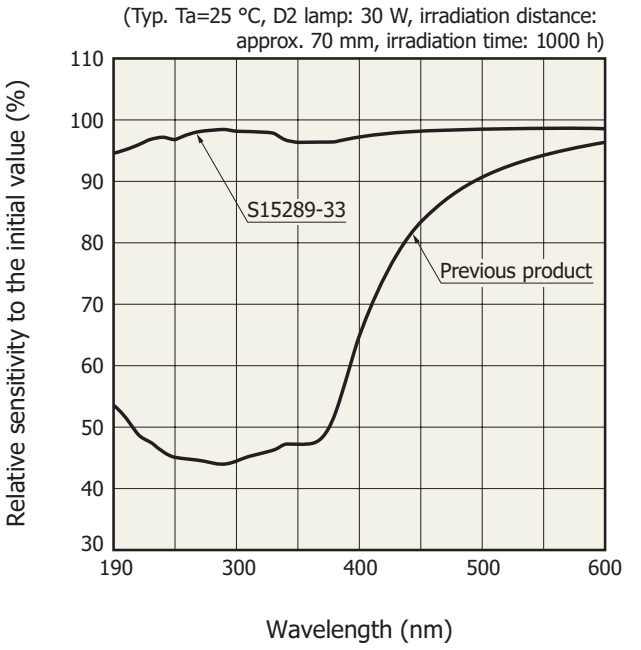
Changes to spectral sensitivity due to UV light irradiation



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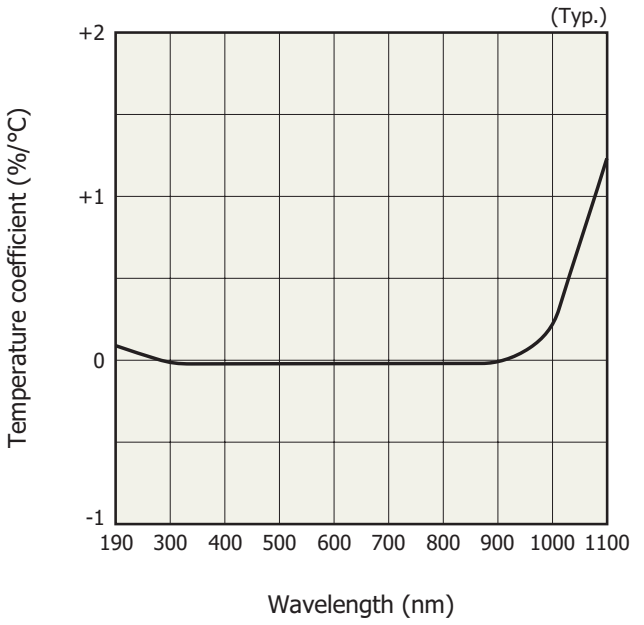
Sensitivity temperature characteristics



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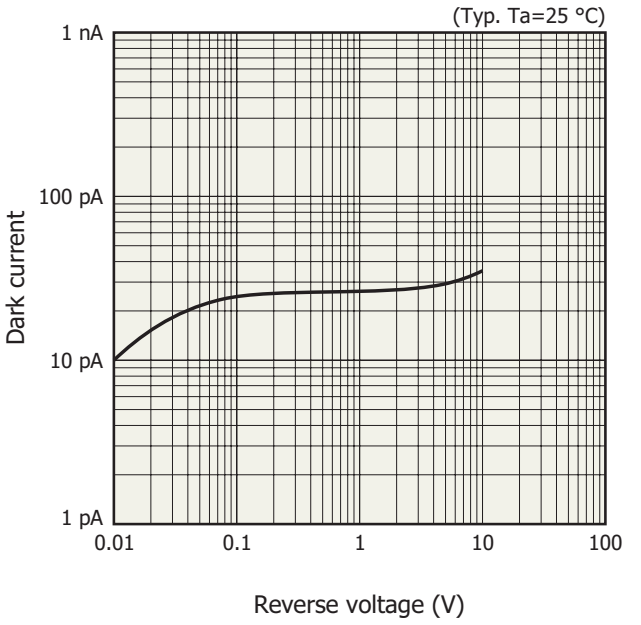
Dark current vs. reverse voltage



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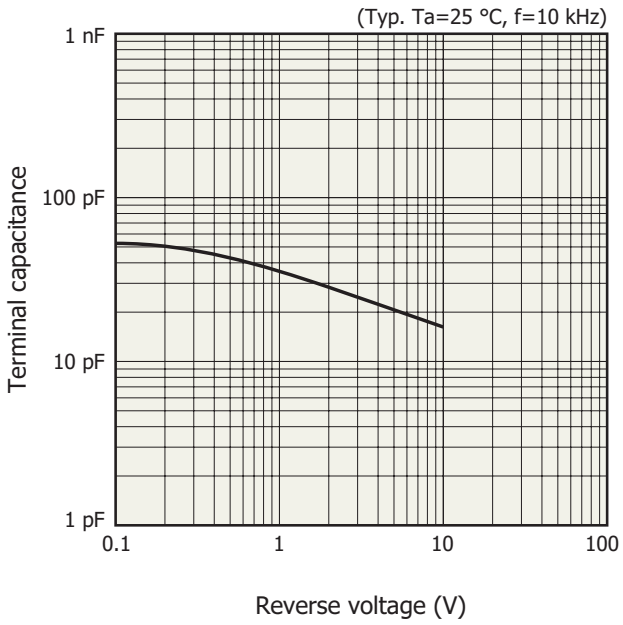
Terminal capacitance vs. reverse voltage



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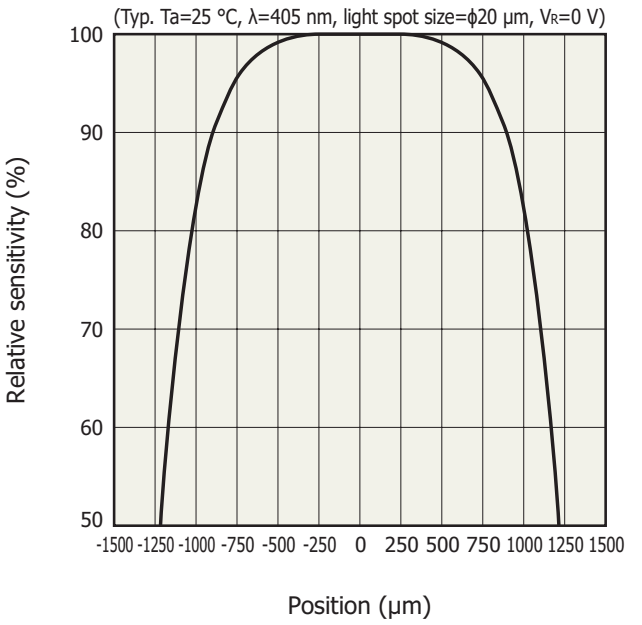
Sensitivity uniformity



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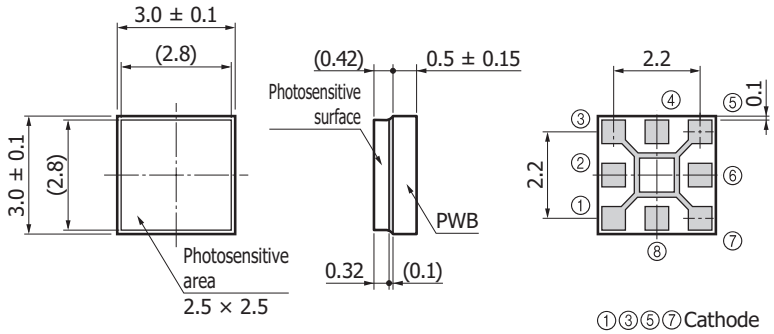
Dimensional outline (unit: mm)



Tolerance unless otherwise noted: ±0.15

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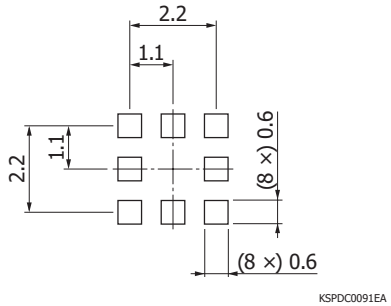
Recommended land pattern (unit: mm)



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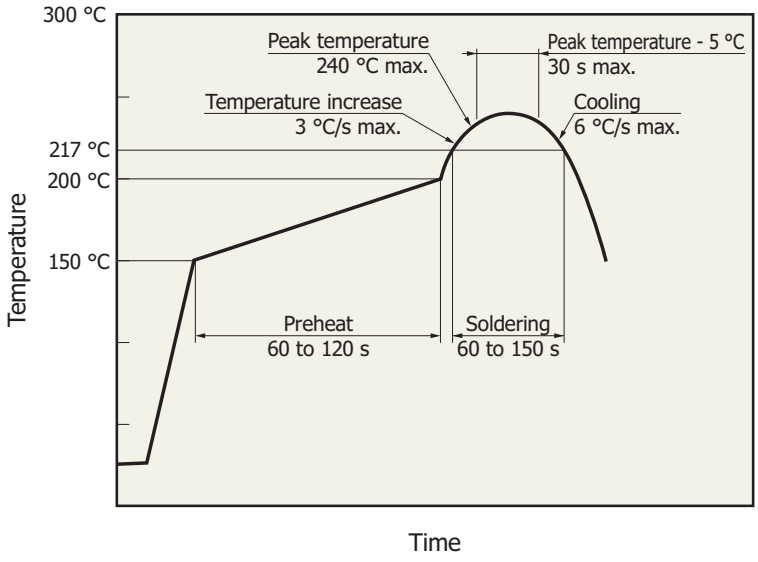
Precautions against UV light exposure

· 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



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· 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.

Related information

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

■ Precautions
· Disclaimer
· Unsealed products

■ Technical information
· Si photodiodes / Technical note

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