

Si photodiodes

S12698 series

High UV resistance, photodiodes for UV monitor

The S12698 series are Si photodiodes that have achieved high reliability for monitoring ultraviolet light. They exhibit low sensitivity deterioration under UV light irradiation and are suitable for applications such as monitoring intense UV light sources. The 3-pin type S12698-07 is also available, in which the case connection pin is electrically independent of the anode.

Features

- With UV glass window (hermetically sealed)
- High sensitivity in UV region
- High reliability for monitoring UV light irradiation
- No resin that causes outgassing

Applications

- Power monitor for UV light sources
- Analytical instruments
- Optical measurement equipment

Structure / Absolute maximum ratings

Type no.	Window material	Package	Photosensitive area size (mm)	Absolute maximum ratings		
				Reverse voltage VR max (V)	Operating temperature* T _{opr} (°C)	Storage temperature* T _{stg} (°C)
S12698	UV glass	TO-18	1.1 × 1.1	5	-40 to +100	-55 to +125
S12698-01		TO-5	2.4 × 2.4			
S12698-04			3.6 × 3.6			
S12698-02			5.8 × 5.8			
S12698-07 NEW		TO-18	1.1 × 1.1			

* No dew condensation

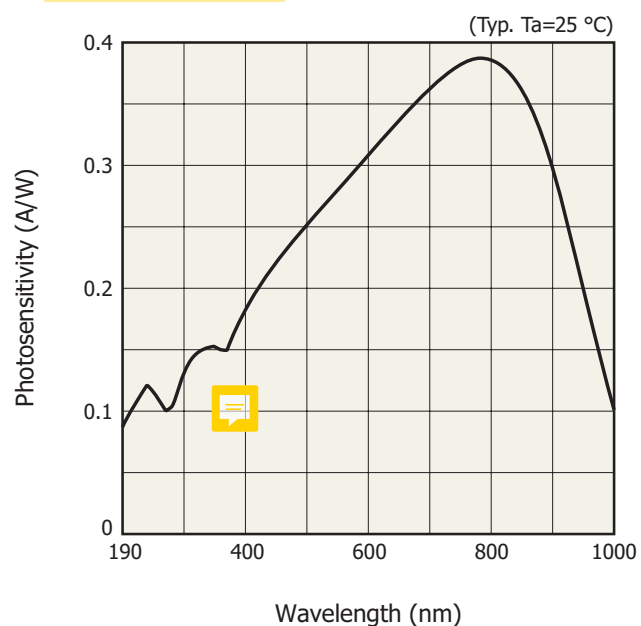
When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation may cause deterioration in characteristics and reliability.

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.

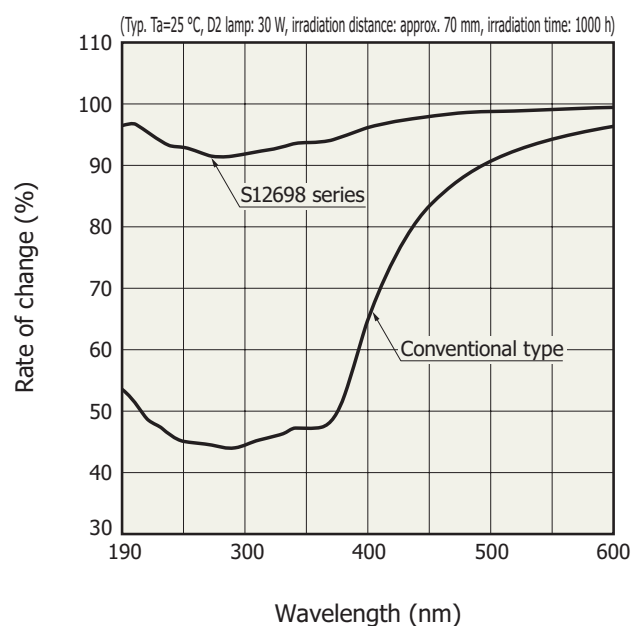
Electrical and optical characteristics (Typ. Ta=25 °C, unless otherwise noted)

Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photosensitivity S $\lambda = \lambda_p$ (A/W)	Short circuit current I _{sc} 100 lx		Dark current I _D VR=10 mV max. (pA)	Temp. coefficient of I _D TCID (times/°C)	Rise time tr VR=0 V RL=1 kΩ λ=655 nm (μs)	Terminal capacitance Ct VR=0 V f=10 kHz (pF)	Shunt resistance Rsh min. (GΩ)	Noise equivalent power NEP (W/Hz ^{1/2})
				Min. (μA)	Typ. (μA)						
S12698	190 to 1000	800	0.38	0.6	0.8	10	1.12	0.1	25	1	1 × 10 ⁻¹⁴
S12698-01				1.7	2.5	30		0.5	230	0.3	2 × 10 ⁻¹⁴
S12698-04				4.3	6.5	50		0.6	240	0.2	2.5 × 10 ⁻¹⁴
S12698-02				12	18	100		1.5	700	0.1	3.5 × 10 ⁻¹⁴
S12698-07 NEW				0.6	0.8	10		0.1	25	1	1 × 10 ⁻¹⁴

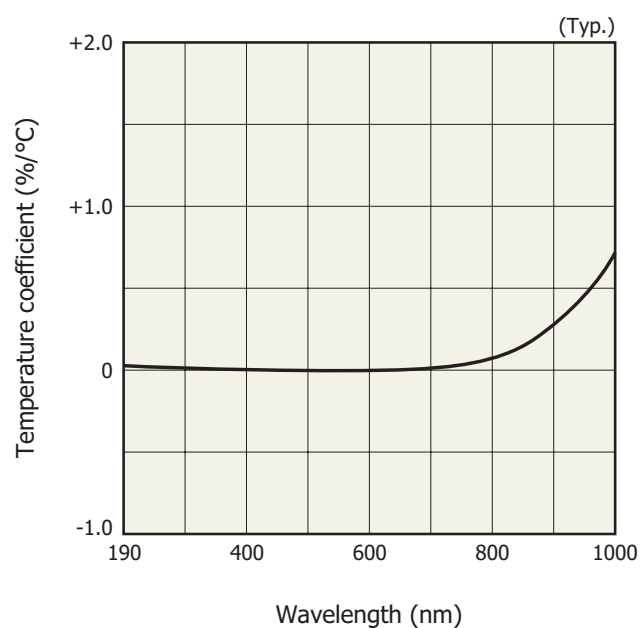
Spectral response



Changes in spectral response after irradiated with UV light

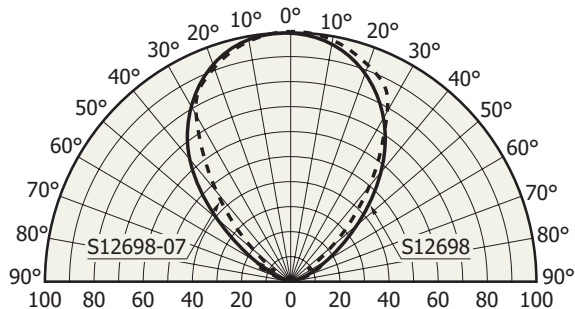


Photosensitivity temperature characteristics



Directivity

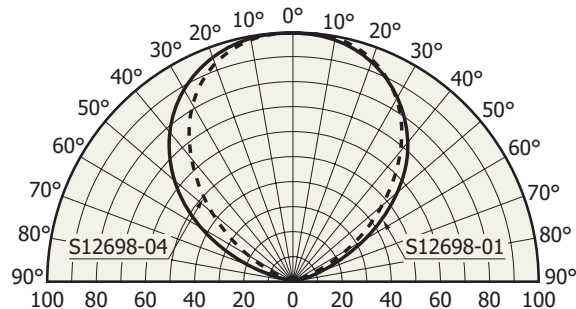
S12698, S12698-07

(Typ. $T_a=25\text{ }^{\circ}\text{C}$, light source: tungsten lamp)

Relative sensitivity (%)

KSPD80439EA

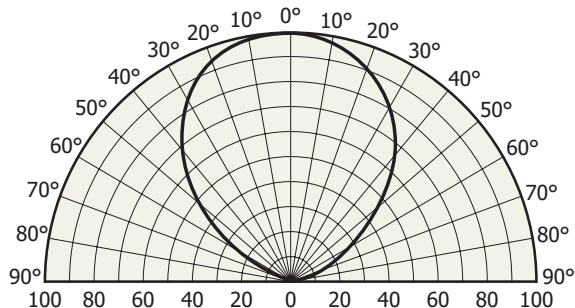
S12698-01, S12698-04

(Typ. $T_a=25\text{ }^{\circ}\text{C}$, light source: tungsten lamp)

Relative sensitivity (%)

KSPD80440EA

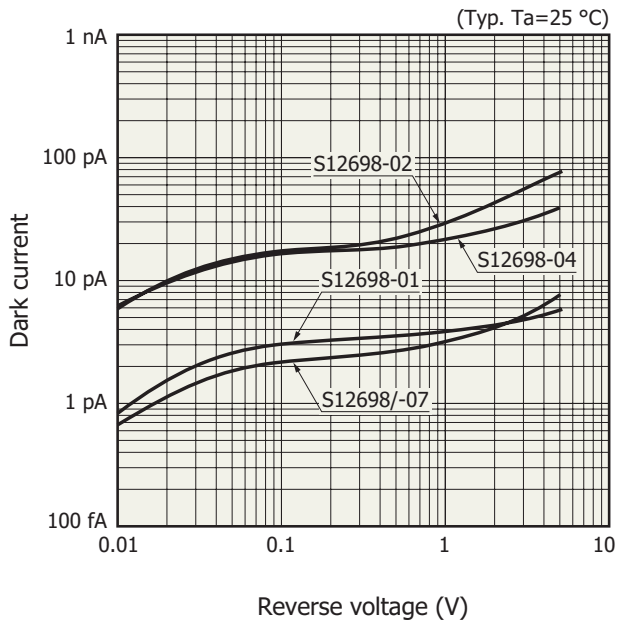
S12698-02

(Typ. $T_a=25\text{ }^{\circ}\text{C}$, light source: tungsten lamp)

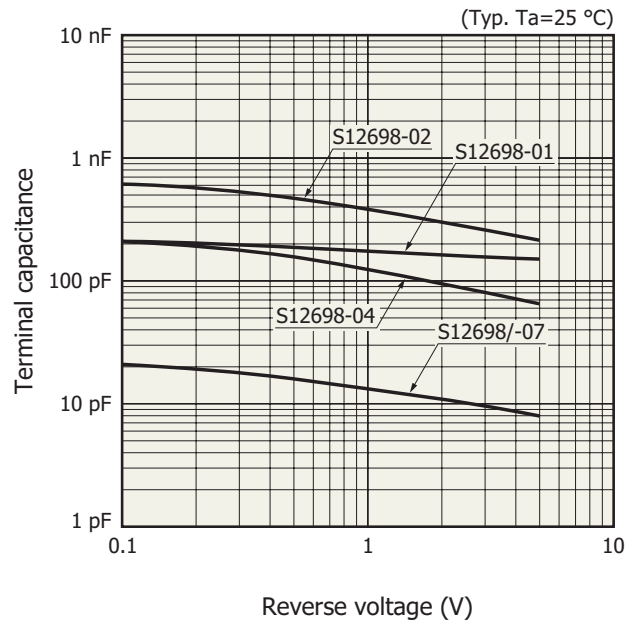
Relative sensitivity (%)

KSPD80441EA

Dark current vs. reverse voltage

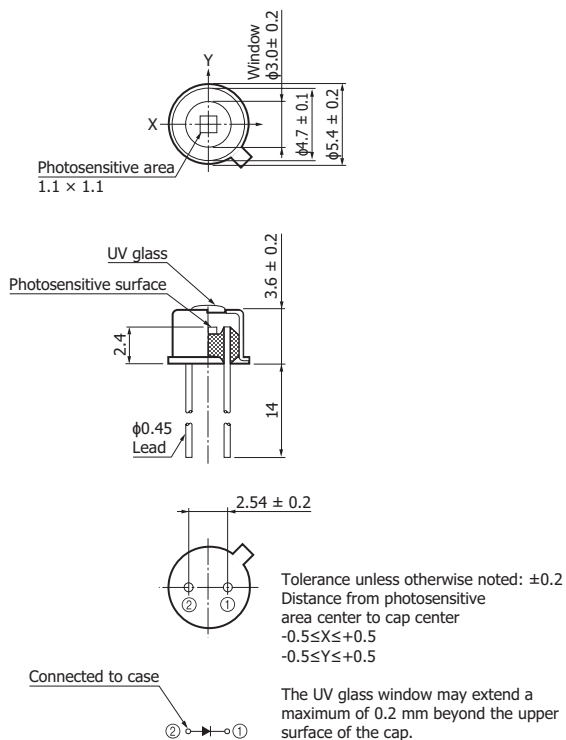


Terminal capacitance vs. reverse voltage

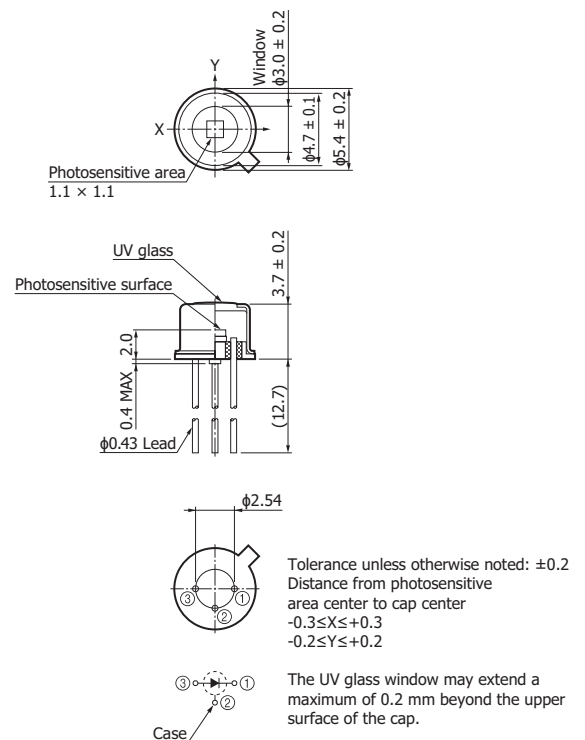


Dimensional outlines (unit: mm)

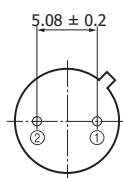
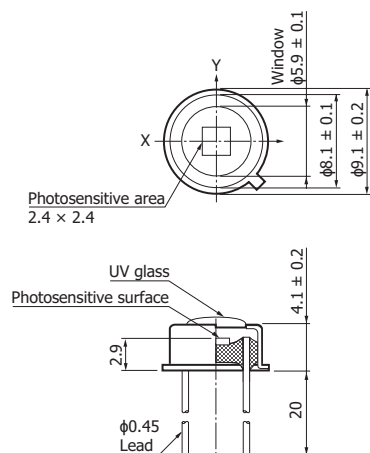
S12698



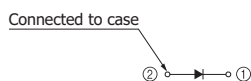
S12698-07



S12698-01



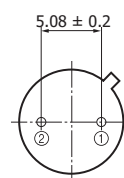
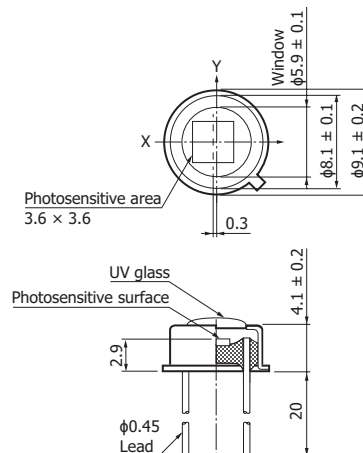
Tolerance unless otherwise noted: ± 0.2
 Distance from photosensitive area center to cap center
 $-0.5 \leq X \leq +0.5$
 $-0.5 \leq Y \leq +0.5$



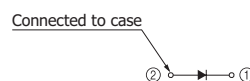
The UV glass window may extend a maximum of 0.2 mm beyond the upper surface of the cap.

KSPDA0210EB

S12698-04



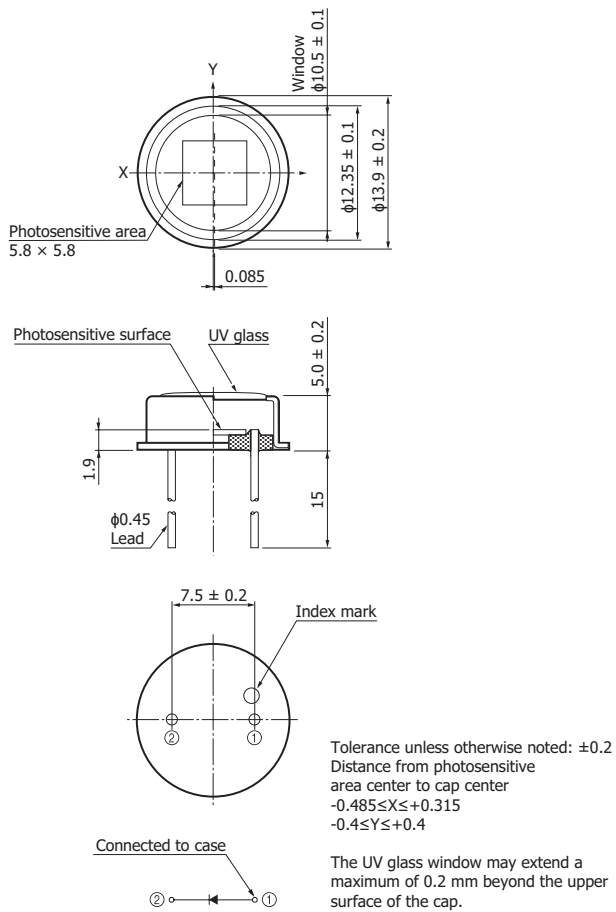
Tolerance unless otherwise noted: ± 0.2
 Distance from photosensitive area center to cap center
 $-0.8 \leq X \leq +0.2$
 $-0.5 \leq Y \leq +0.5$



The UV glass window may extend a maximum of 0.2 mm beyond the upper surface of the cap.

KSPDA0221EA

S12698-02



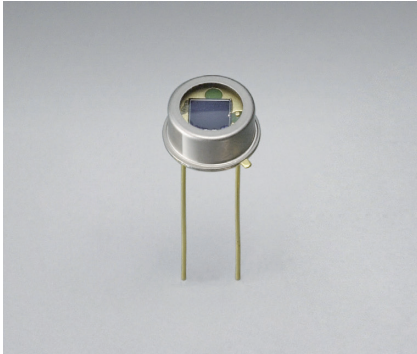
KSPDA0211EB

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, usage time, and ambient 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.

Related products

Si photodiode S12698-01Q for UV laser monitor



In an environment exposed to high-power UV lasers, etc. for a long period of time, a phenomenon called solarization can occur in which the transmission of window glass decreases. To meet this harsh environment, we also offer the S12698-01Q, which is based on the S12698-01 and suppresses solarization of the window material.

Related information

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

■ Precautions

- Disclaimer
- Metal, ceramic, plastic package products

■ Technical note

- Si photodiodes

Information described in this material is current as of July 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.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

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