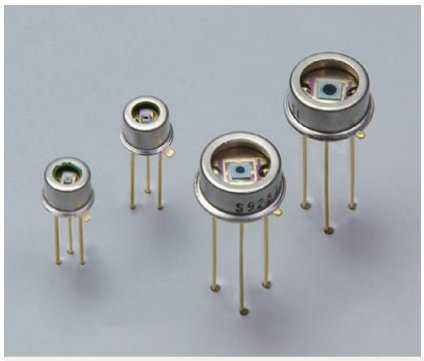
HAMAMATSU
PHOTON IS OUR BUSINESS

Si APD



S9251/S12092 series

High sensitivity in near infrared range (λ=900 nm)

These are Si APDs that offer enhanced 900 nm band near-infrared sensitivity. They are suitable for applications such as optical rangefinders.

Features

- **High sensitivity in near infrared range (λ=900 nm)**
- **Stable operation**

Applications

- **Optical rangefinders**
- **FSO (free space optics)**

Structure / Absolute maximum ratings

Type no.	Dimensional outline/ Window material*1	Package	Effective*2 photosensitive area size (mm)	Absolute maximum ratings		
				Operating temperature Topr (°C)	Storage temperature Tstg (°C)	Soldering conditions
S12092-02	(1)/K	TO-18	ϕ0.2	-20 to +85	-55 to +125	260 °C or less, within 10 s
S12092-05			ϕ0.5			
S9251-10	(2)/K	TO-5	ϕ1.0			
S9251-15			ϕ1.5			

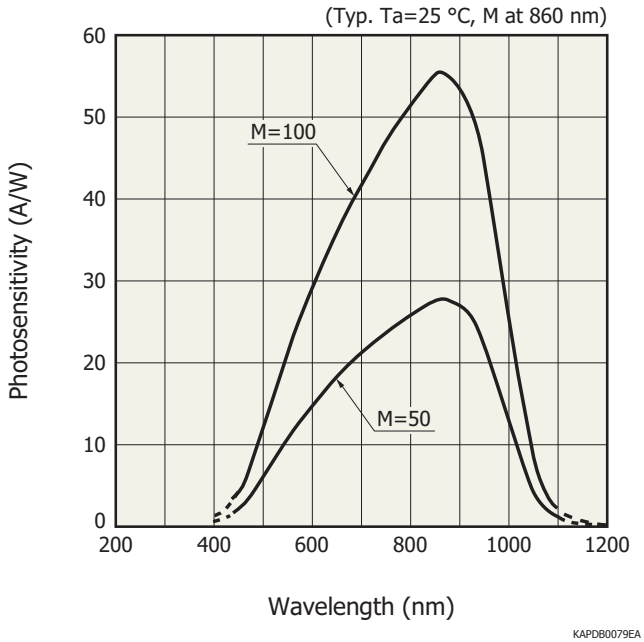
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.
*1: K=borosilicate glass
*2: Area in which a typical gain can be obtained

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

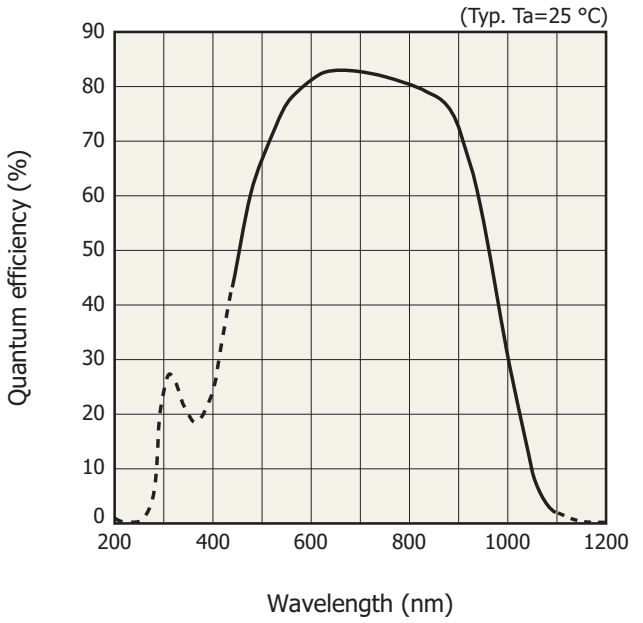
Type no.	Spectral response range λ (nm)	Peak*3 sensitivity wavelength λp (nm)	Photo-sensitivity S M=1 λ=900 nm (A/W)	Quantum efficiency QE M=1 λ=900 nm (%)	Breakdown voltage VBR ID=100 μA		Temp. coefficient of VBR (V/°C)	Dark*2 current ID		Cutoff*3 frequency fc RL=50 Ω (MHz)	Terminal*3 capacitance Ct (pF)	Excess*3 noise figure x λ=900 nm	Gain M λ=900 nm
					Typ. (V)	Max. (V)		Typ. (nA)	Max. (nA)				
S12092-02	440 to 1100	860	0.52	72	250	350	1.85	0.1	1	400	0.4	0.3	100
S12092-05								0.2	2		0.7		
S9251-10								0.4	4	380	1.9		
S9251-15								0.8	8	350	3.6		

*3: Values measured at a gain listed in the characteristics table

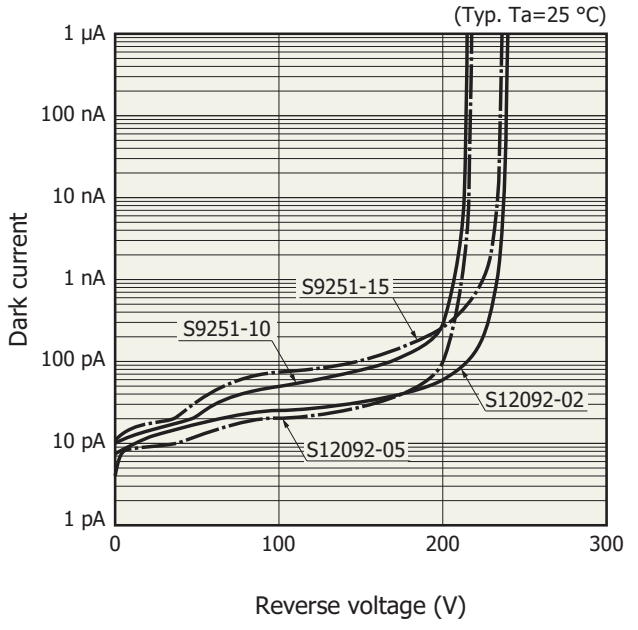
Spectral response



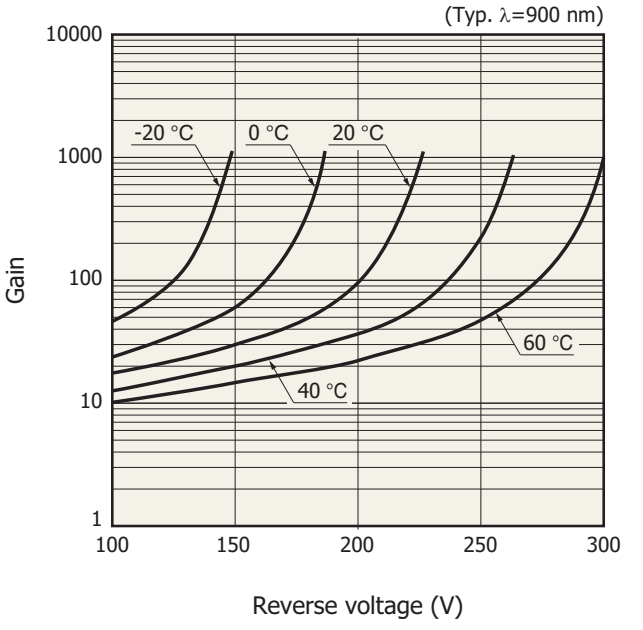
Quantum efficiency vs. wavelength



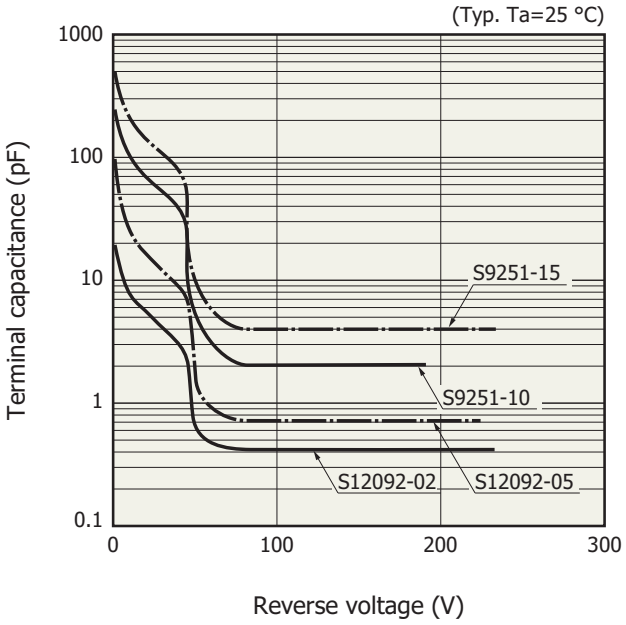
Dark current vs. reverse voltage



Gain vs. reverse voltage



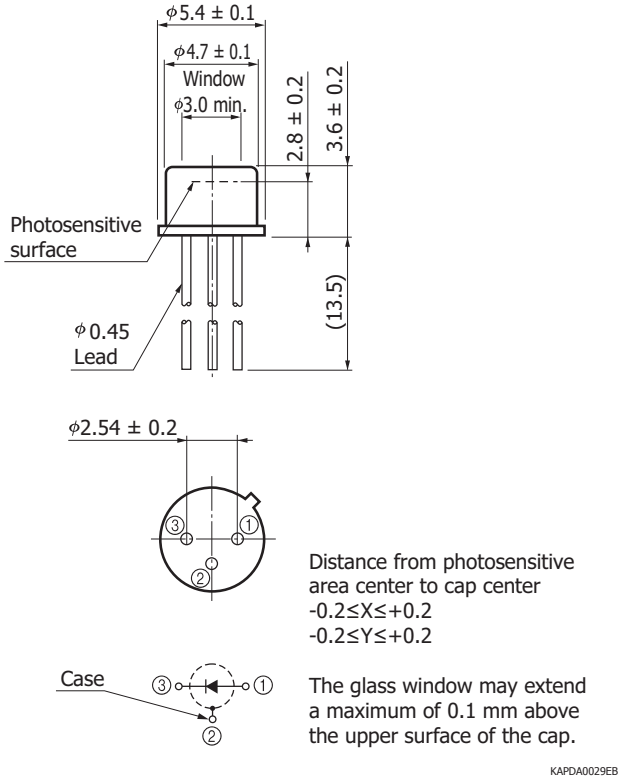
Terminal capacitance vs. reverse voltage



KAPDB0083EB

Dimensional outlines (unit: mm)

(1) S12092-02/-05

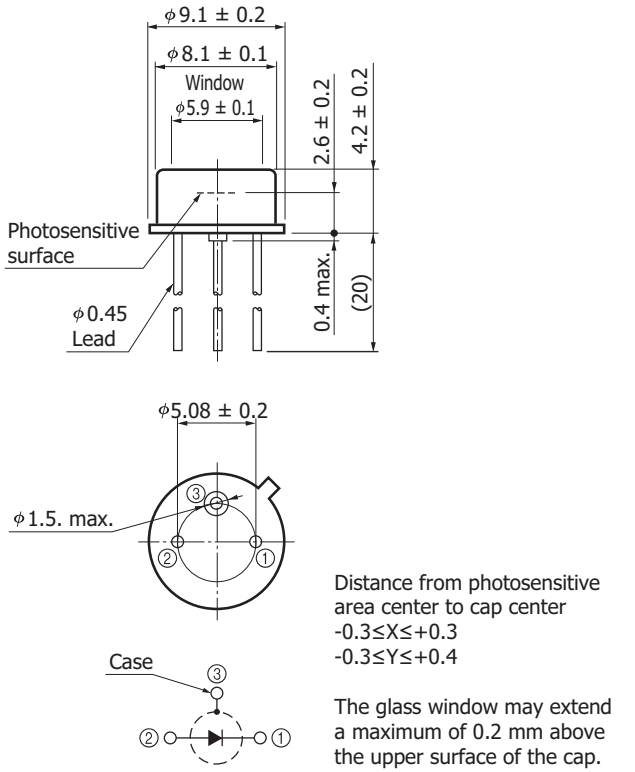


Distance from photosensitive area center to cap center
-0.2≤X≤+0.2
-0.2≤Y≤+0.2

The glass window may extend a maximum of 0.1 mm above the upper surface of the cap.

KAPDA0029EB

(2) S9251-10/-15



Distance from photosensitive area center to cap center
-0.3≤X≤+0.3
-0.3≤Y≤+0.4

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

KAPDA0030EB

Replacements for previous products

Previous product (listed on the previous datasheet)	Replacement (listed on this datasheet)
S9251-02	S12092-02
S9251-05	S12092-05

* Products that have been removed from this datasheet

Related information

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

■ Precautions

· Disclaimer
· Metal, ceramic, plastic package products

■ Technical information

· Si APD

HAMAMATSU www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184
U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218
Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8
France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777
North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01
Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39) 02-93581733, Fax: (39) 02-93581741
China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866

Cat. No. KAPD1013E06 Mar. 2017 DN