

S9251/S12092 series

**High sensitivity in near infrared range
($\lambda=900$ 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 ($\lambda=900$ nm)
- Stable operation

Applications

- Optical rangefinders
- FSO (free space optics)

Structure / Absolute maximum ratings

Type no.	Dimensional out-line/ 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	ϕ 0.2	-20 to +85	-55 to +125	260 °C or less, within 10 s
S12092-05			ϕ 0.5			
S9251-10	(2)/K	TO-5	ϕ 1.0			
S9251-15			ϕ 1.5			

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

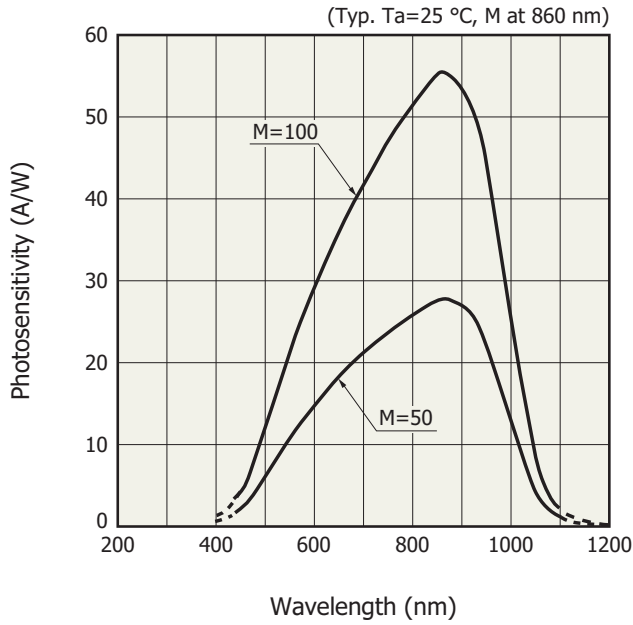
*2: Area in which a typical gain can be obtained

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

Type no.	Spectral response range λ (nm)	Peak*3 sensitivity wavelength λ_p (nm)	Photo- sensitivity S M=1 $\lambda=900$ nm (A/W)	Quantum efficiency QE M=1 $\lambda=900$ nm (%)	Breakdown voltage VBR ID=100 μ A		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 $\lambda=900$ nm	Gain M $\lambda=900$ nm
					Typ.	Max.		Typ.	Max.				
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		1.9		
S9251-15								0.8	8		3.6		

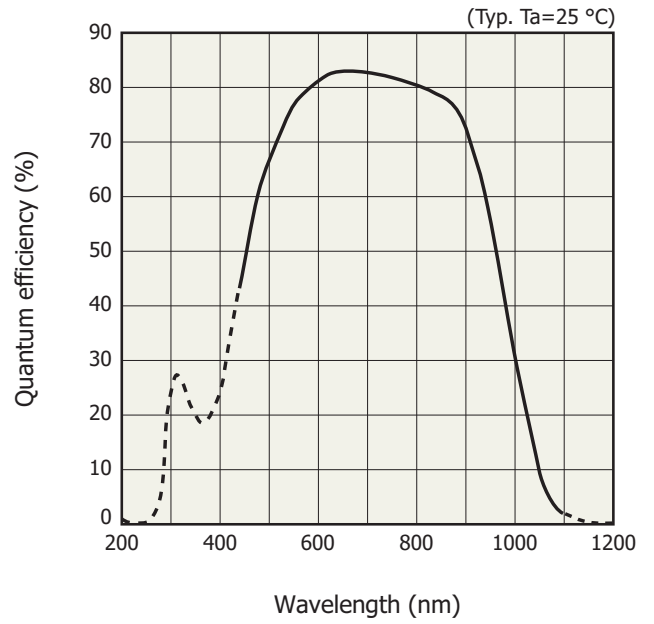
*3: Values measured at a gain listed in the characteristics table

Spectral response (M=100)



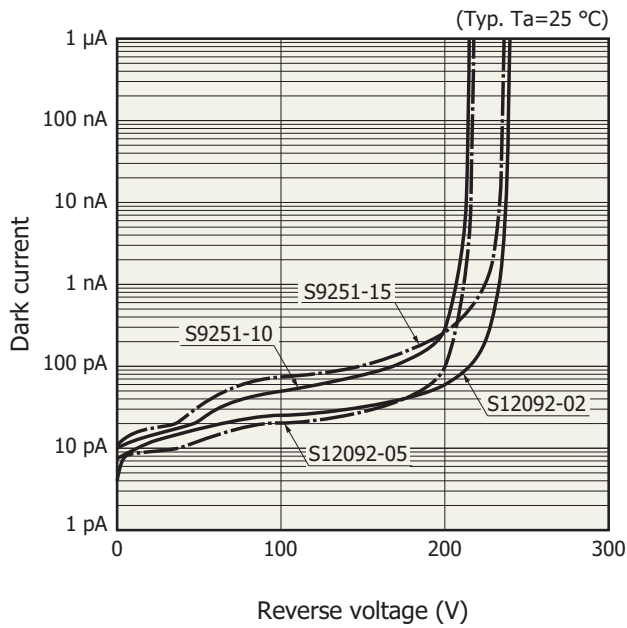
KAPDB0079EA

Quantum efficiency vs. wavelength



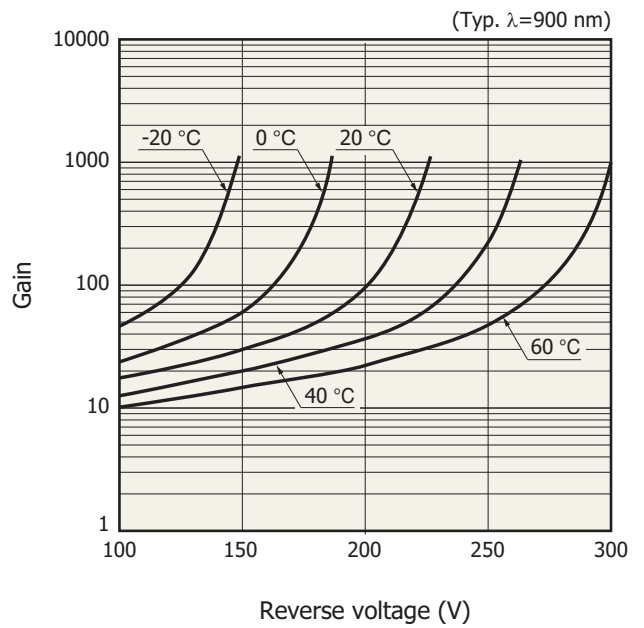
KAPDB0080EB

Dark current vs. reverse voltage



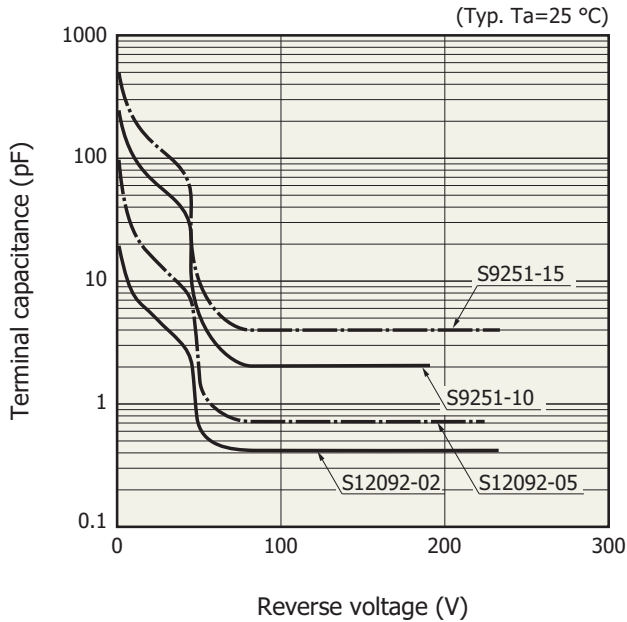
KAPDB0081EB

Gain vs. reverse voltage



KAPDB0082EA

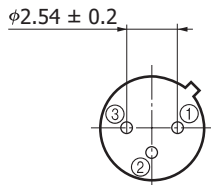
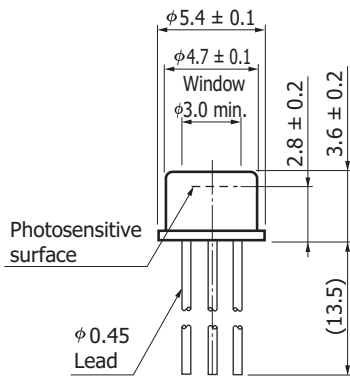
Terminal capacitance vs. reverse voltage



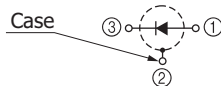
KAPD80083EB

Dimensional outlines (unit: mm)

(1) S12092-02/-05



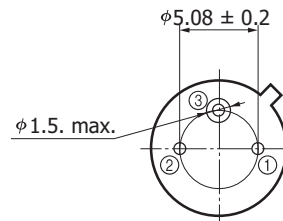
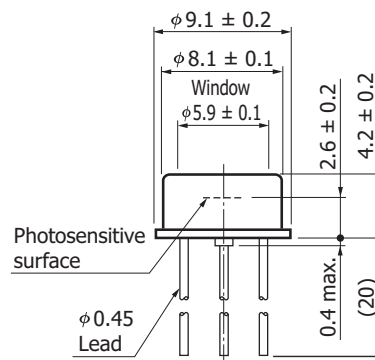
Distance from photosensitive area center to cap center
 $-0.2 \leq X \leq +0.2$
 $-0.2 \leq Y \leq +0.2$



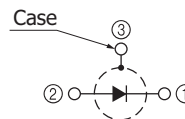
The glass window may extend a maximum of 0.1 mm above the upper surface of the cap.

KAPDA0029EB

(2) S9251-10/-15



Distance from photosensitive area center to cap center
 $-0.3 \leq X \leq +0.3$
 $-0.3 \leq Y \leq +0.4$



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

- Notice
- Metal, ceramic, plastic package products / Precautions

Technical information

- Si APD / Technical information

Information described in this material is current as of August, 2016.

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.

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