

# Si PIN photodiodes

S10783

S10784



## High-speed detectors with plastic package

The S10783 and S10784 are high-speed APC (auto power control) detectors developed for monitoring laser diodes with a peak wavelength of 660 nm or 780 nm. The S10783 is designed for surface mount and the S10784 is a plastic package with  $\phi 3$  mm lens.

### Features

- **High-speed response**  
300 MHz typ. ( $\lambda=650$  nm,  $V_R=2.5$  V)  
250 MHz typ. ( $\lambda=780$  nm,  $V_R=2.5$  V)
- **High sensitivity**  
S10783: 0.46 A/W typ. ( $\lambda=650$  nm)  
S10784: 0.45 A/W typ. ( $\lambda=650$  nm)

### Applications

- Laser diode monitors of optical disk unit (high-speed APC)
- Sensors for red laser diode

### Structure

Parameter	Symbol	S10783	S10784	Unit
Photosensitive area size	-	$\phi 0.8$	$\phi 3.0$	mm
Effective photosensitive area	-	0.5	7.0	mm <sup>2</sup>
Package	-	Surface mount type plastic	Plastic with lens	-

### Absolute maximum ratings

Parameter	Symbol	S10783	S10784	Unit
Reverse voltage	$V_R$ max	20		V
Power dissipation	P	50		mW
Operating temperature	$T_{opr}$	-25 to +85		°C
Storage temperature	$T_{stg}$	-40 to +100		°C

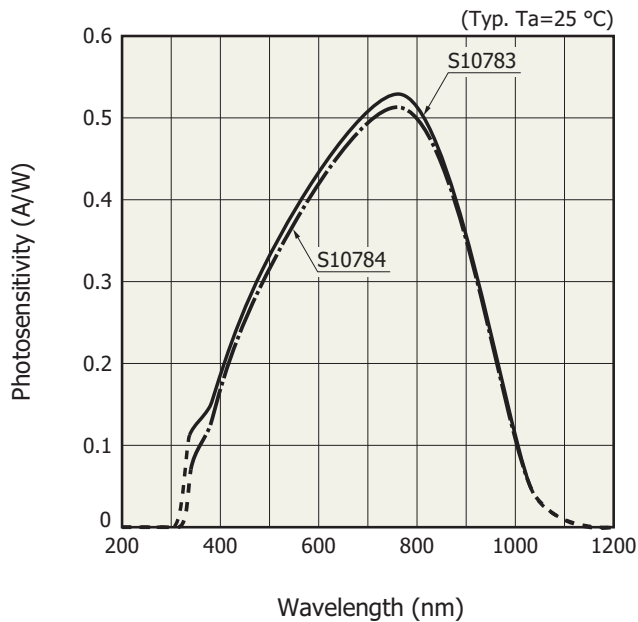
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

This product does not support lead-free soldering. For details on reflow soldering conditions for surface-mount components, please contact our sales office.

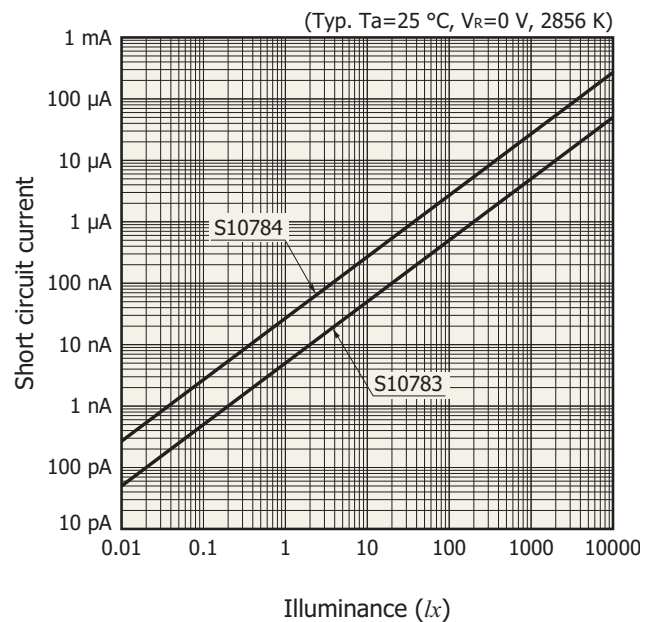
### Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	S10783			S10784			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		330 to 1040			340 to 1040			nm
Peak sensitivity wavelength	$\lambda_p$		-	760	-	-	760	-	nm
Photosensitivity	S	$\lambda=660$ nm	0.41	0.46	-	0.40	0.45	-	A/W
		$\lambda=780$ nm	0.47	0.52	-	0.46	0.51	-	
Dark current	$I_D$	$V_R=2.5$ V	-	0.01	1.0	-	0.01	1.0	nA
Temperature coefficient of $I_D$	$T_{CID}$		-	1.15	-	-	1.15	-	times/°C
Cutoff frequency	$f_c$	$V_R=2.5$ V	$\lambda=660$ nm	150	300	-	150	300	MHz
		$R_L=50$ $\Omega$	$\lambda=780$ nm	125	250	-	125	250	
Terminal capacitance	$C_t$	$V_R=2.5$ V, $f=1$ MHz	-	4.5	9	-	4.5	9	pF
Noise equivalent power	NEP	$V_R=2.5$ V	-	$3.5 \times 10^{-15}$	-	-	$3.5 \times 10^{-15}$	-	W/Hz <sup>1/2</sup>

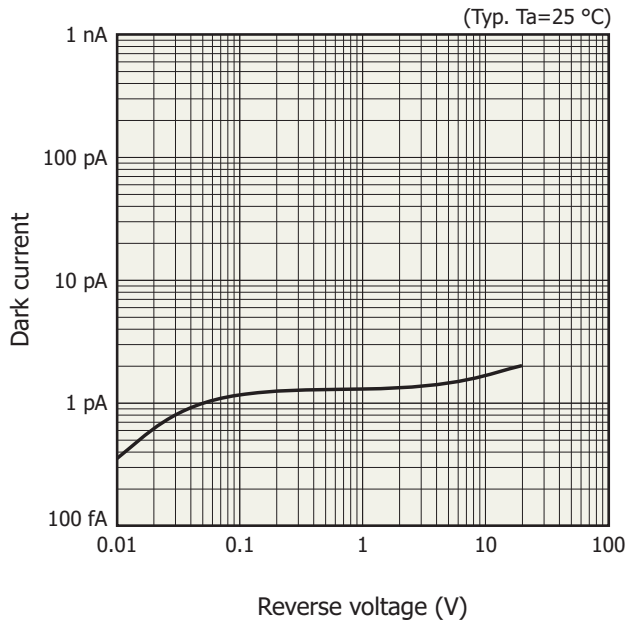
### Spectral response



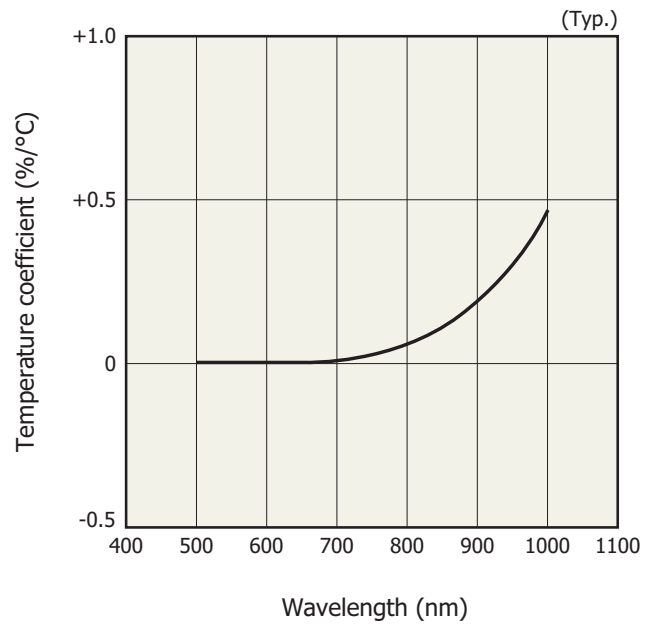
### Linearity



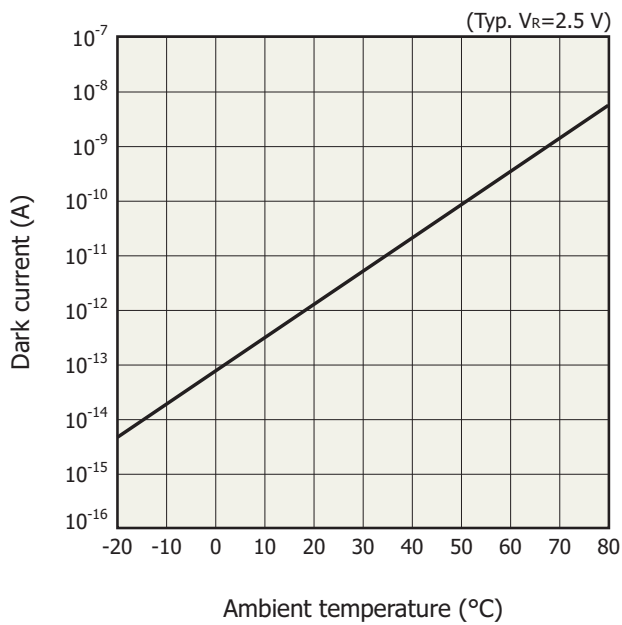
**Dark current vs. reverse voltage**



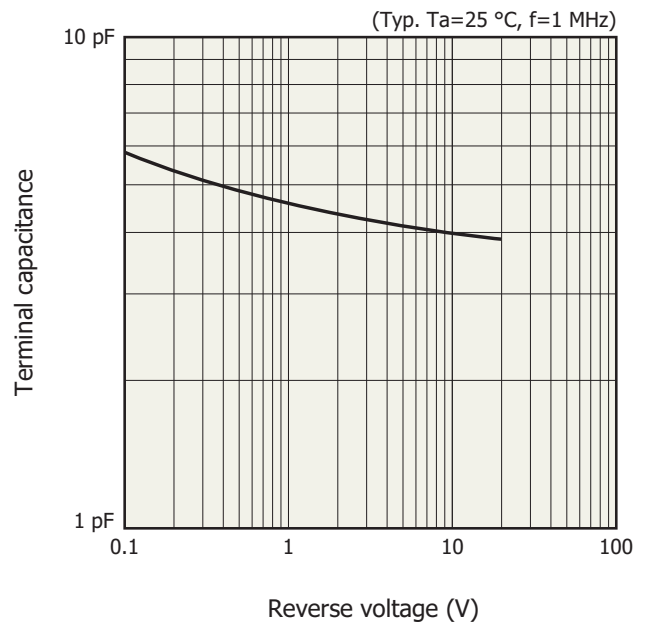
**Photosensitivity temperature characteristics**



**Dark current vs. ambient temperature**

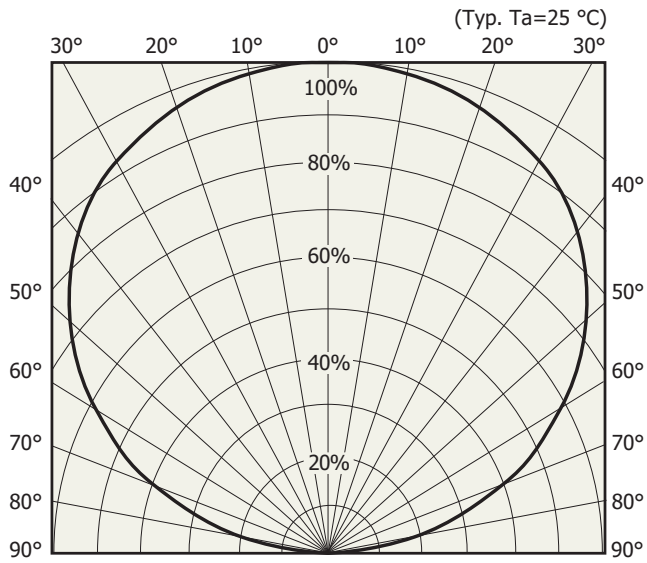


**Terminal capacitance vs. reverse voltage**



**Directivity**

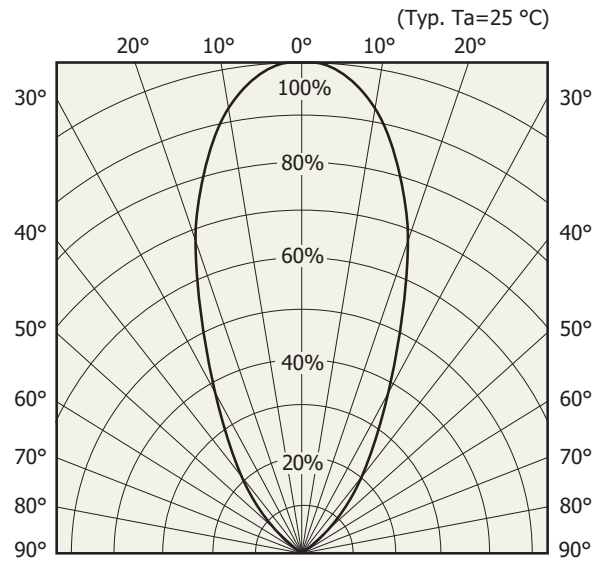
S10783



Relative sensitivity

KPINB0362EA

S10784

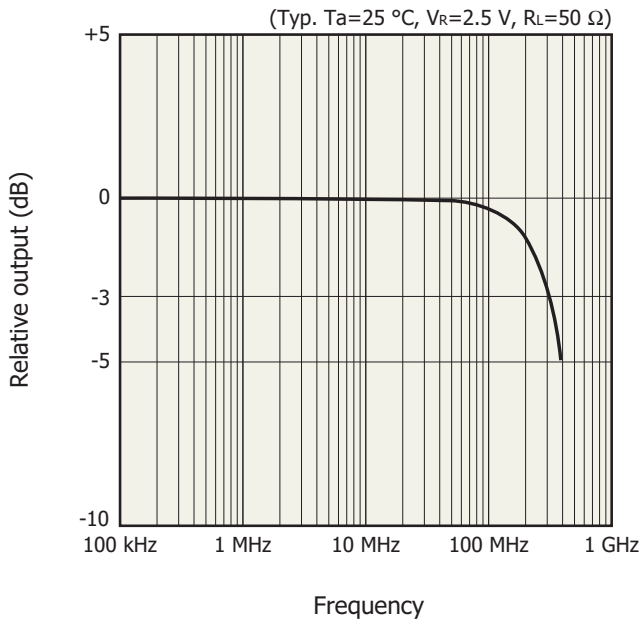


Relative sensitivity

KPINB0359EA

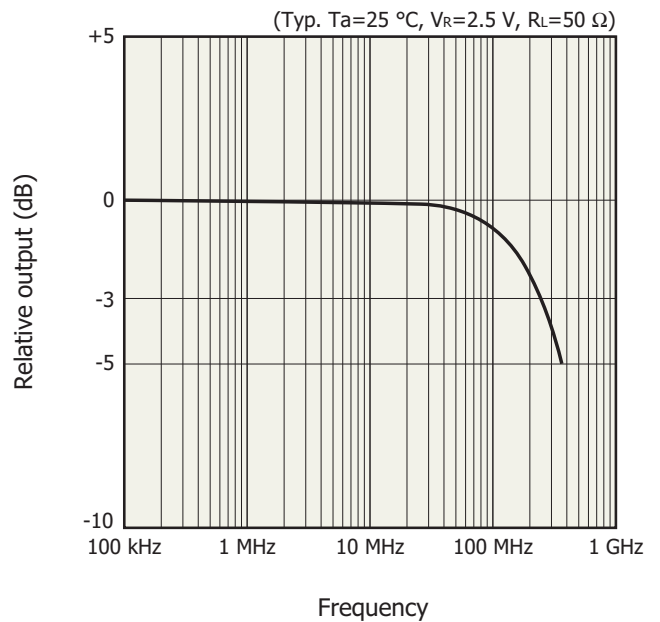
**Frequency characteristics**

$\lambda=660$  nm



KPINB0360EA

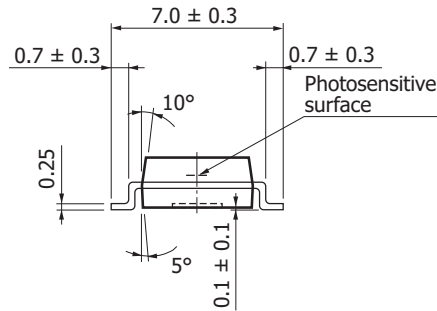
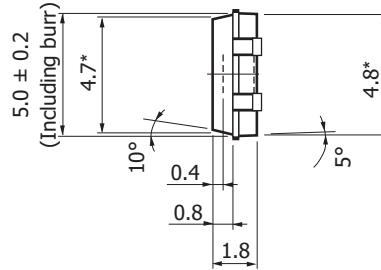
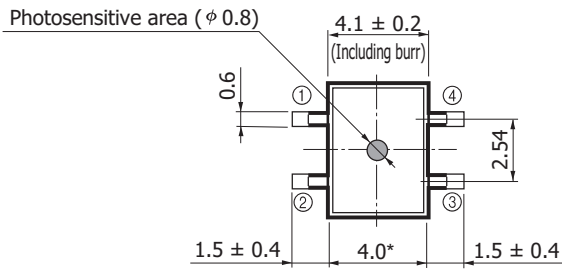
$\lambda=780$  nm



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Dimensional outlines (unit: mm)

S10783

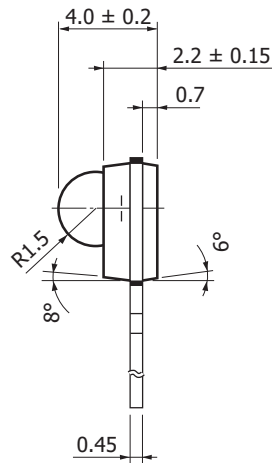
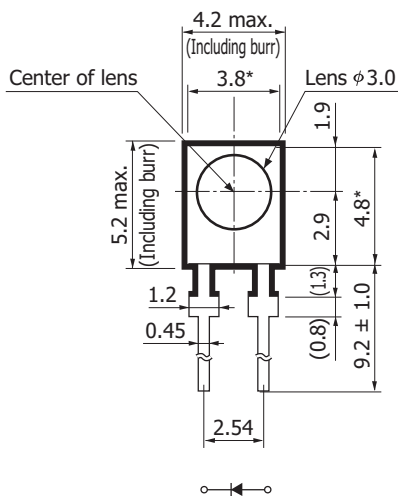
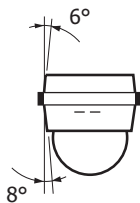


- ① NC
- ② Cathode
- ③ Anode
- ④ Cathode

Tolerance unless otherwise noted:  $\pm 0.1$   
 Position accuracy of photosensitive area center with respect to the package dimensions marked \*  
 $X, Y \leq \pm 0.2$   
 $\theta \leq \pm 2^\circ$   
 Lead surface finish: silver plating  
 Standard packing: stick (50 pcs/stick)

KPINA0105EB

S10784



Tolerance unless otherwise noted:  $\pm 0.1$   
 Position accuracy of photosensitive area center with respect to the package dimensions marked \*  
 $X, Y \leq \pm 0.2$   
 $\theta \leq \pm 2^\circ$   
 Lead surface finish: silver plating  
 Standard packing: polyethylene pack [anti-static type] (500 pcs/pack)

KPINA0032EC

Information described in this material is current as of May, 2013.

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.

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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, P.O.Box 6910, Bridgewater, N.J. 08807-0910, 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: Thorshamnsgatan 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) 02-935-81-733, Fax: (39) 02-935-81-741

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866