

# 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 monitor of optical disk unit (high-speed APC)
- Sensor 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

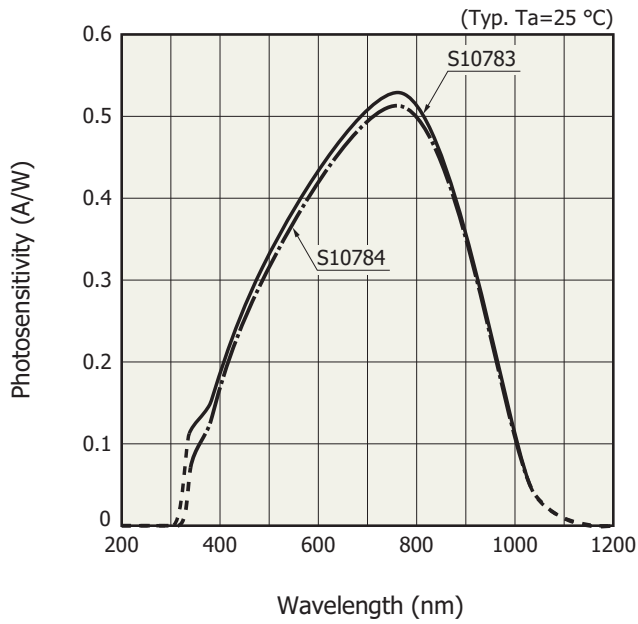
Parameter	Symbol	S10783	S10784	Unit
Reverse voltage	$V_R$ max.	20		V
Power dissipation	P	50		mW
Operating temperature	$T_{opr}$	-25 to +85		°C
Storage temperature	$T_{stg}$	-40 to +100		°C

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.

### Electrical and optical characteristics ( $T_a=25$ °C)

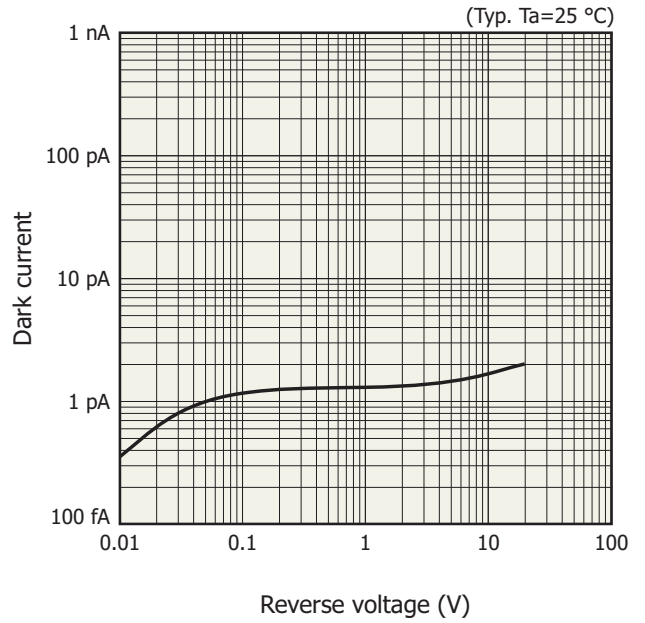
Parameter	Symbol	Condition	S10783			S10784			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		330 to 1040			340 to 1040			nm
Peak sensitivity wavelength	$\lambda_p$		-	760	-	-	760	-	nm
Photosensitivity	S	$\lambda=660$ nm	0.41	0.46	-	0.40	0.45	-	A/W
		$\lambda=780$ nm	0.47	0.52	-	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 $I_D$	$TC_{ID}$		-	1.15	-	-	1.15	-	times/°C
Cutoff frequency	$f_c$	$V_R=2.5$ V	150	300	-	150	300	-	MHz
		$R_L=50$ $\Omega$							
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**



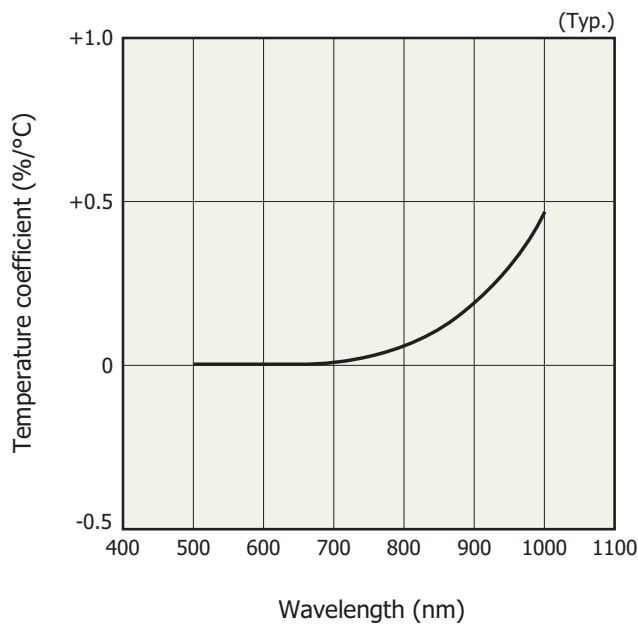
KPINB0355EA

**Dark current vs. reverse voltage**



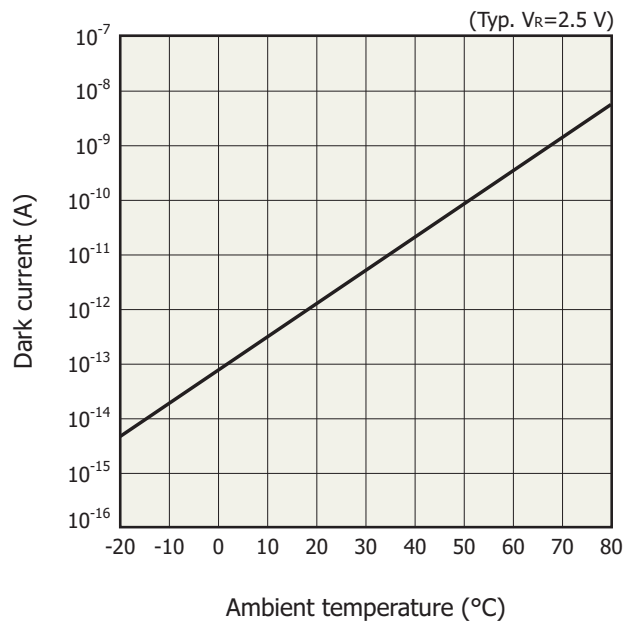
KPINB0356EA

**Photosensitivity temperature characteristic**



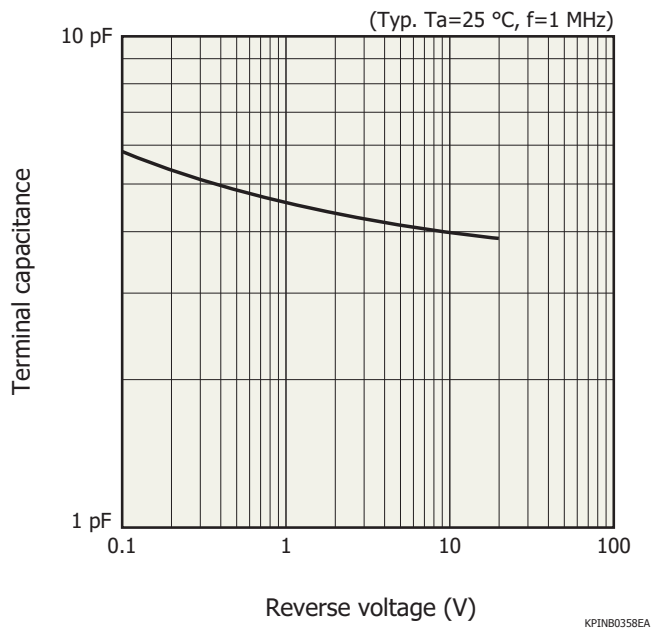
KPINB0357EA

**Dark current vs. ambient temperature**



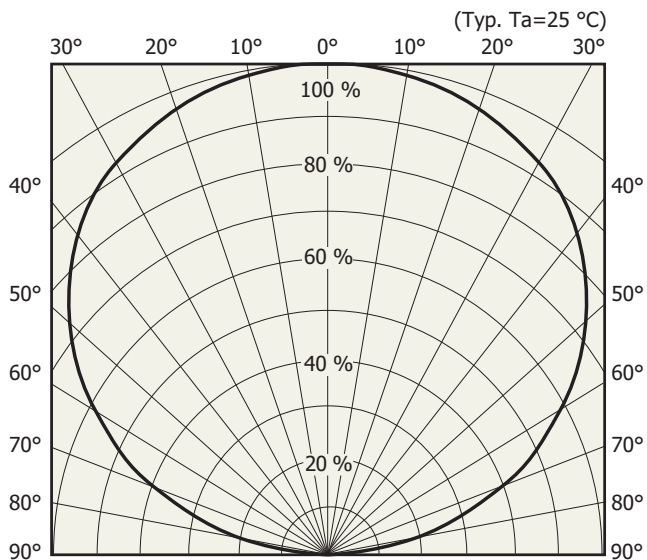
KPINB0363EA

**Terminal capacitance vs. reverse voltage**

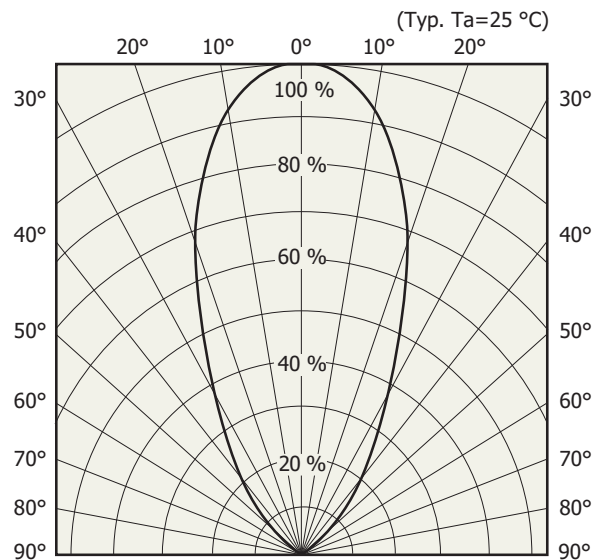


**Directivity**

S10783



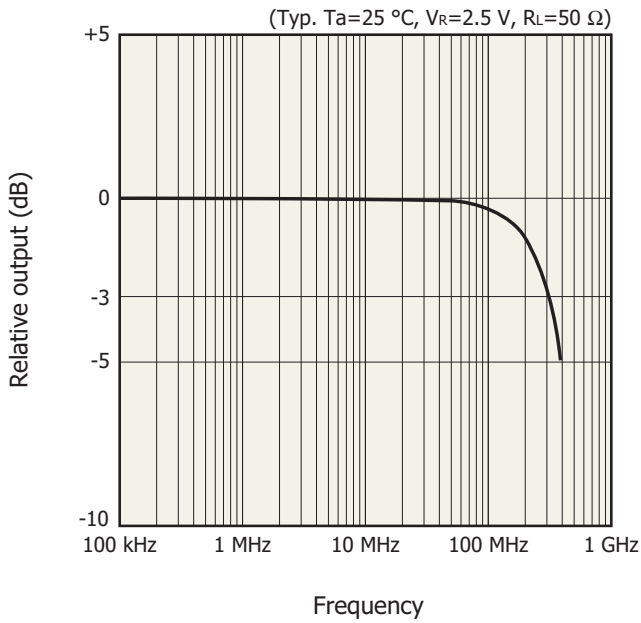
S10784



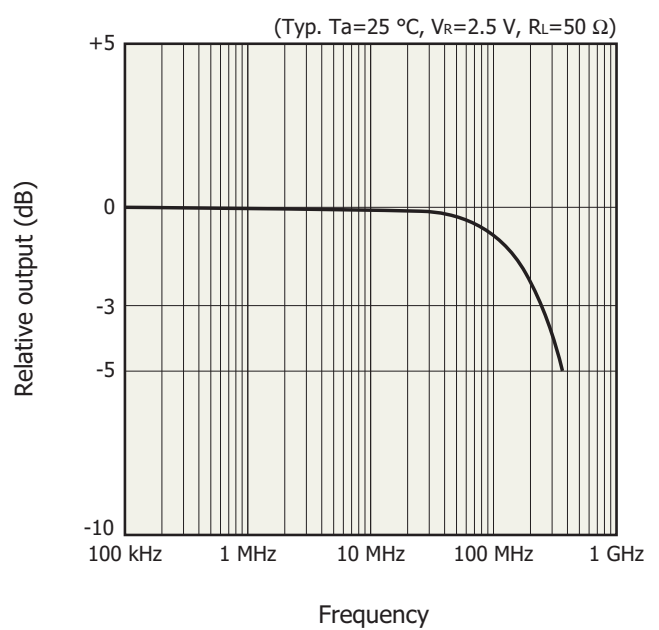
Frequency characteristics

$\lambda=660\text{ nm}$

$\lambda=780\text{ nm}$



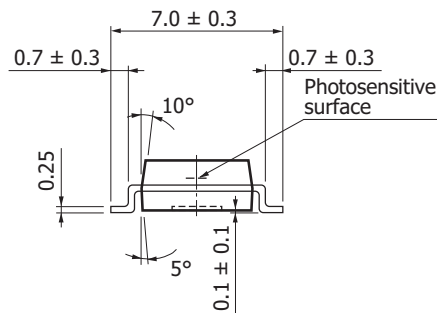
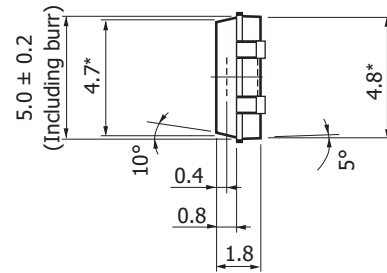
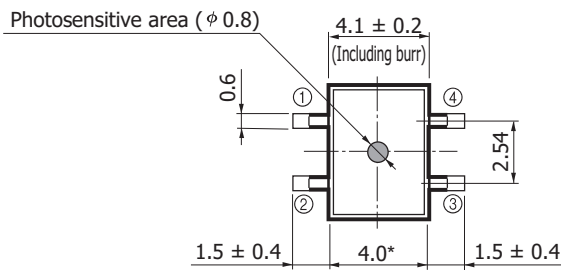
KPINB0360EA



KPINB0361EA

Dimensional outlines (unit: mm)

S10783



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

Chip position accuracy with respect to the package dimensions marked \*

X, Y  $\pm 0.2$

$\theta \pm 2^\circ$

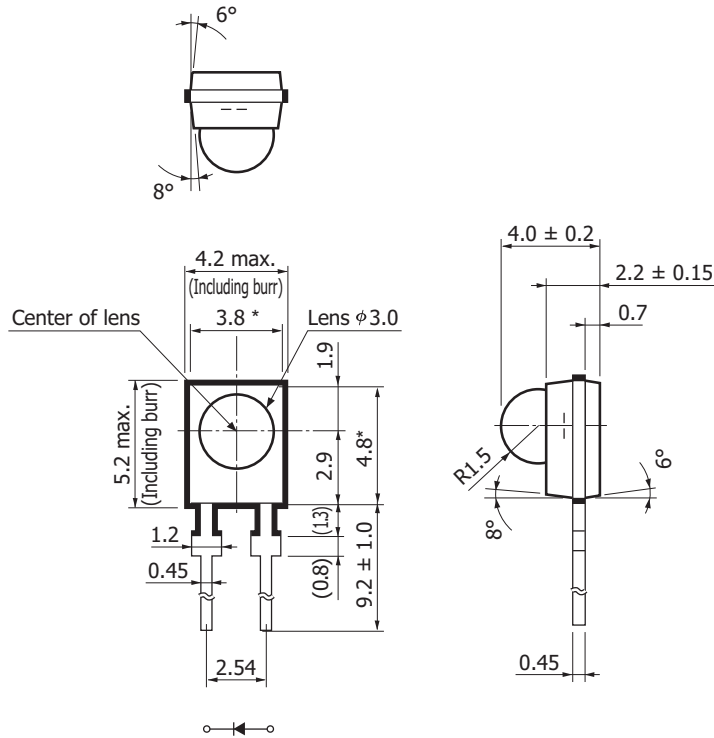
Tolerance unless otherwise noted:  $\pm 0.1$

Lead surface finish: silver plating

Packing: stick (50 pcs/stick)

KPINA0105EB

S10784



Chip position accuracy with respect to the package dimensions marked \*

X, Y  $\pm 0.2$

$\theta \pm 2^\circ$

Tolerance unless otherwise noted:  $\pm 0.1$

Lead surface finish: silver plating

Packing: polyethylene pack [anti-static type]  
(500 pcs/pack)

KPINA0032EC

Information described in this material is current as of July, 2012.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental 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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