

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 ²
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

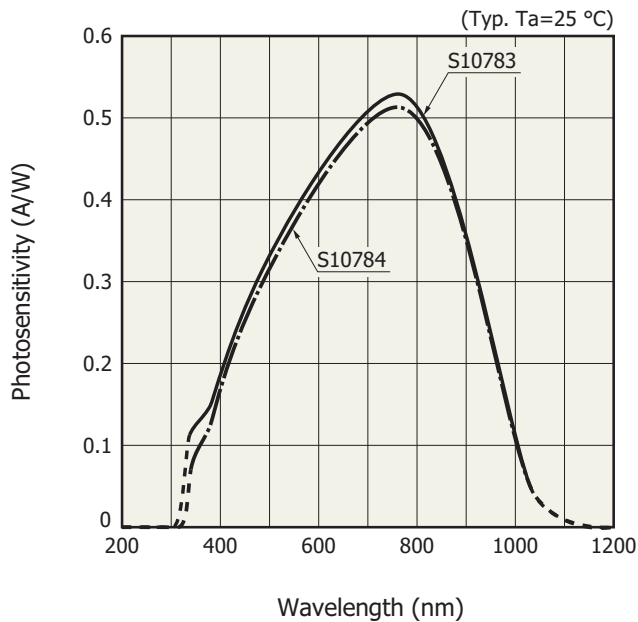
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

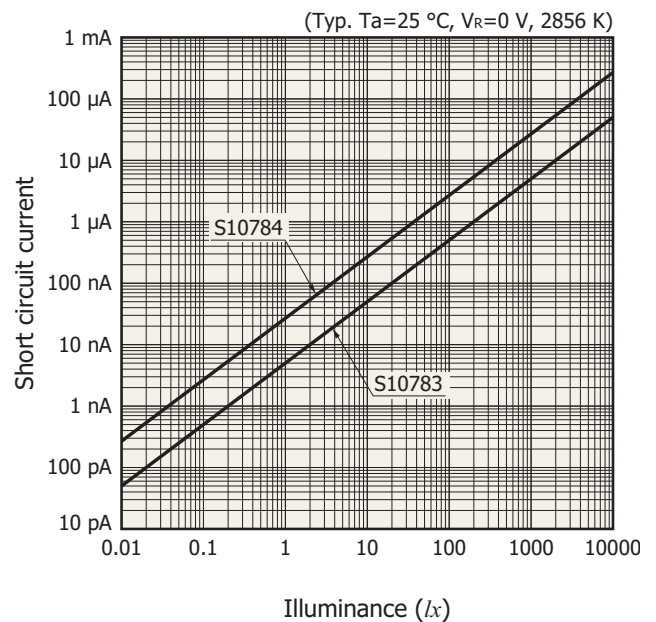
Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	S10783			S10784			Unit	
			Min.	Typ.	Max.	Min.	Typ.	Max.		
Spectral response range	λ		330 to 1040			340 to 1040			nm	
Peak sensitivity wavelength	λ_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 $R_L=50$ Ω	$\lambda=660$ nm	150	300	-	150	300	-	MHz
			$\lambda=780$ 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	-	3.5×10^{-15}	-	-	3.5×10^{-15}	-	W/Hz ^{1/2}	

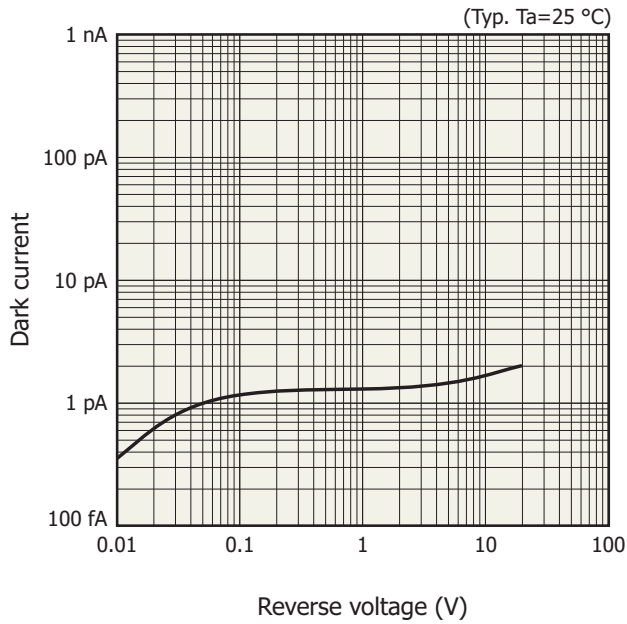
Spectral response



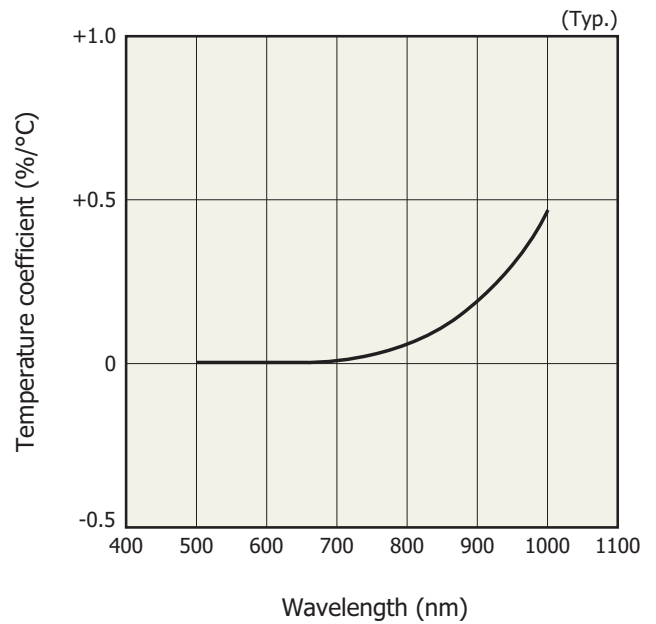
Linearity



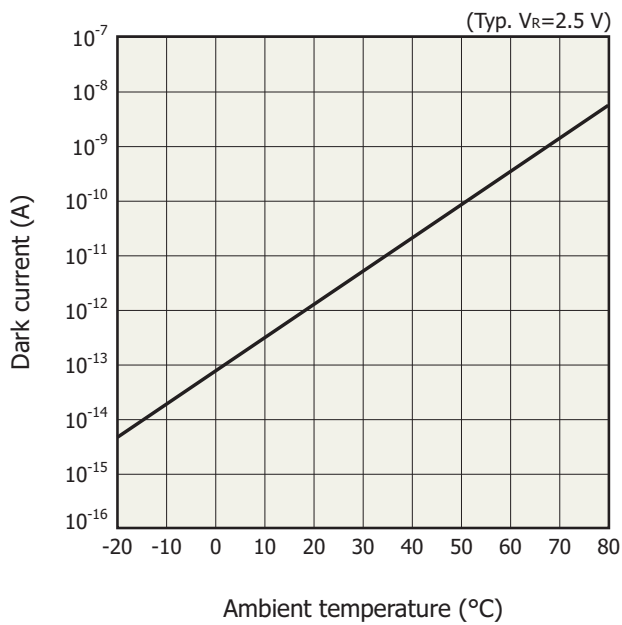
Dark current vs. reverse voltage



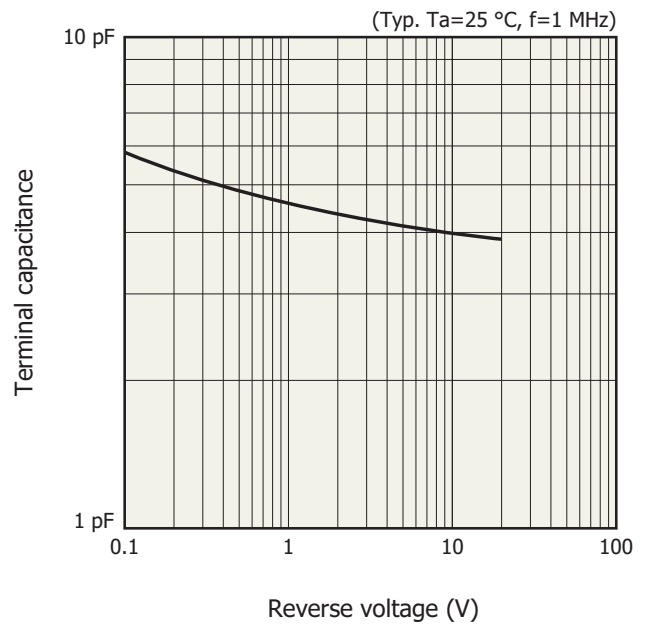
Photosensitivity temperature characteristics



Dark current vs. ambient temperature

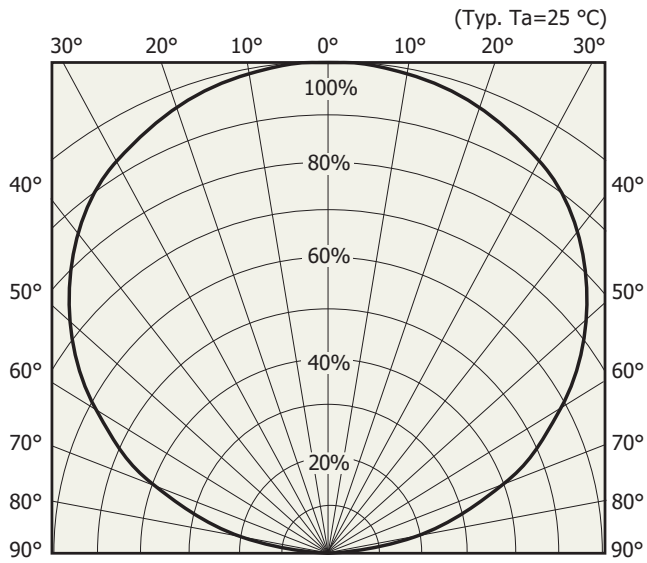


Terminal capacitance vs. reverse voltage



Directivity

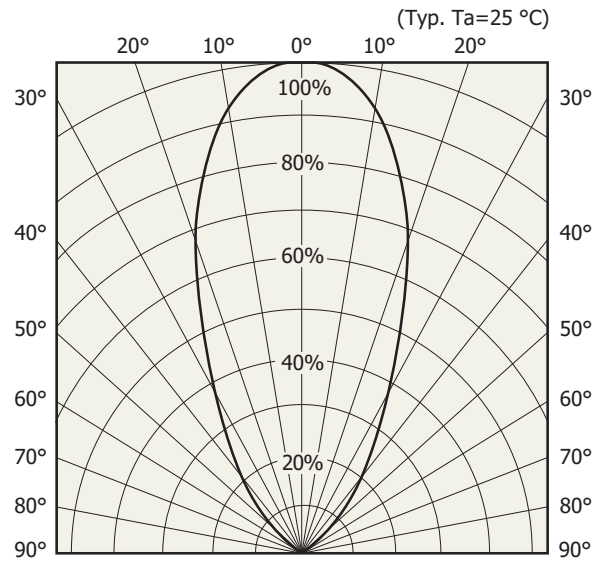
S10783



Relative sensitivity

KPINB0362EA

S10784

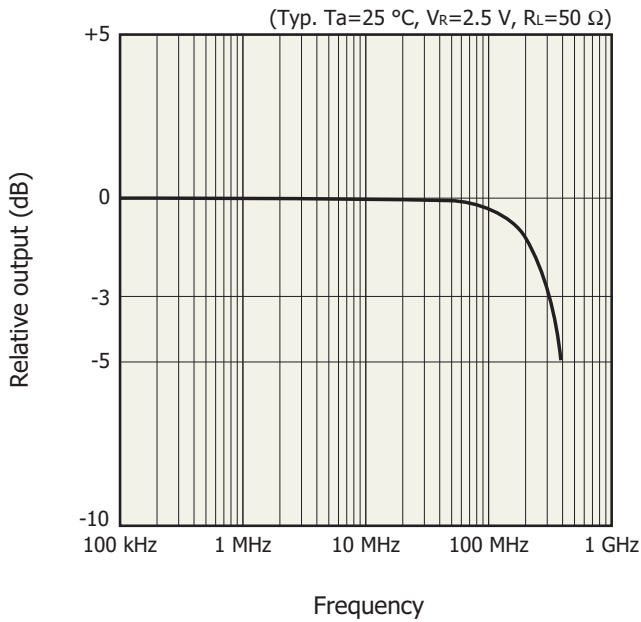


Relative sensitivity

KPINB0359EA

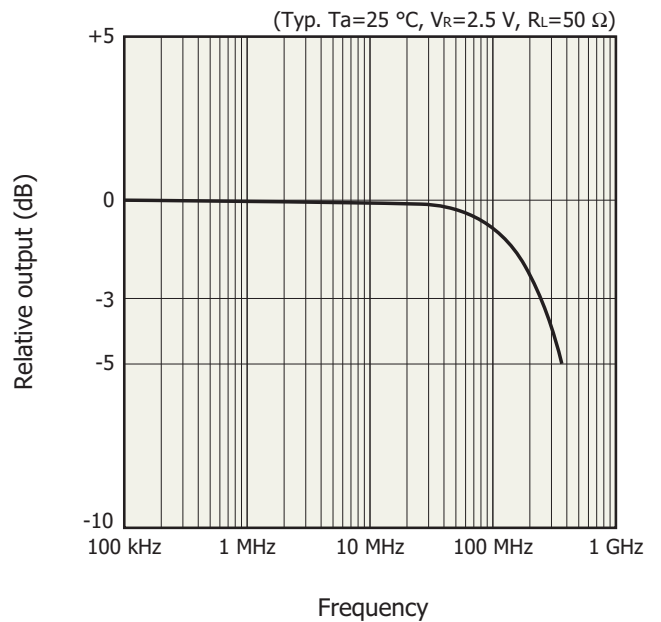
Frequency characteristics

$\lambda=660$ nm



KPINB0360EA

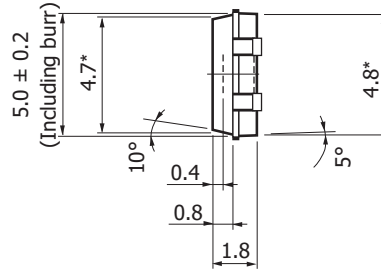
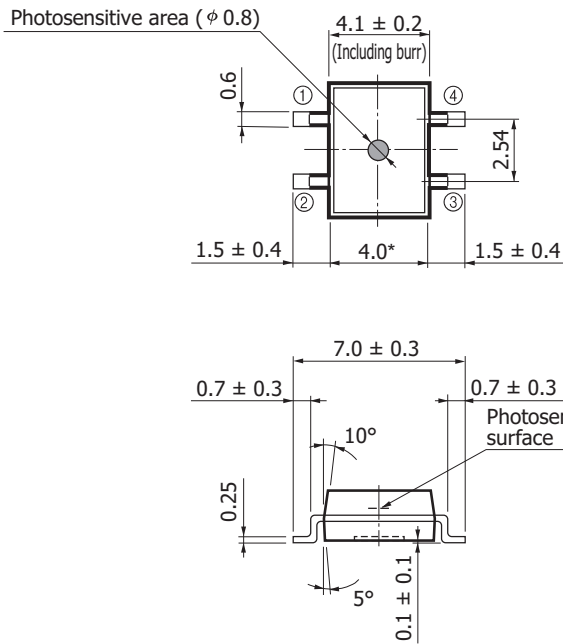
$\lambda=780$ nm



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Dimensional outlines (unit: mm)

S10783

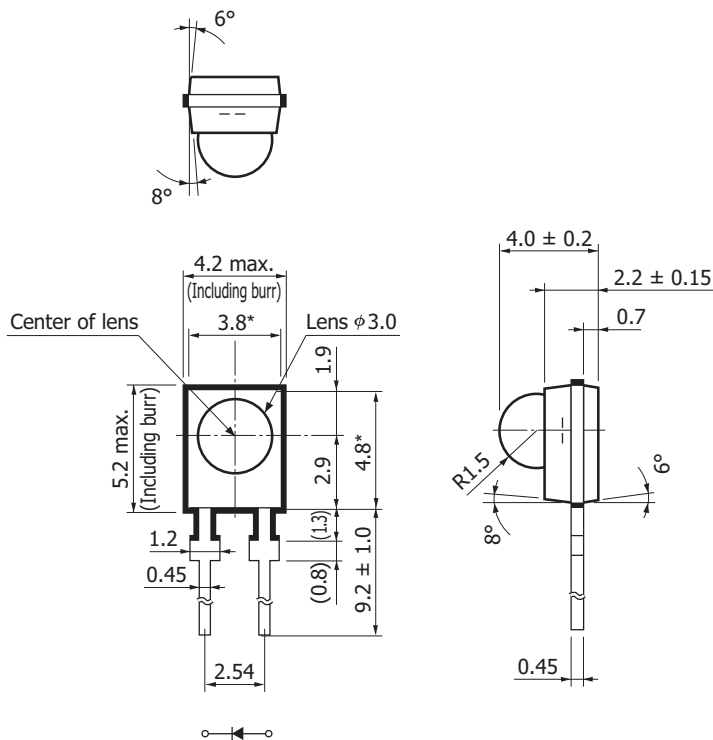


- ① NC
- ② Cathode
- ③ Anode
- ④ Cathode

Tolerance unless otherwise noted: ± 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)

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Tolerance unless otherwise noted: ± 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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