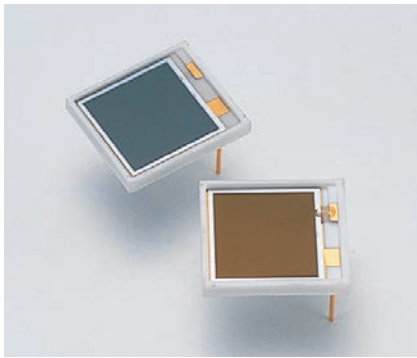


# Si PIN photodiode

S3590-08/-09/-18/-19



## Large active area Si PIN photodiode

### Features

- Sensitivity matching with BGO and CsI (TI) scintillators: S3590-08/-09
- Sensitivity matching with blue scintillator (LSO, GSO, etc.): S3590-18/-19
- Bare chip type (unsealed): S3590-09/-19
- High quantum efficiency: S3590-09 ( $\lambda=540$  nm)  
S3590-19 ( $\lambda=400$  nm)
- Low capacitance
- High-speed response
- High stability
- Good energy resolution

### Applications

- Scintillation detectors
- Hodoscopes
- TOF counters
- Radiation detection
- X-ray detection

### Structure / Absolute maximum ratings

Type No.	Window material	Active area (mm)	Depletion layer thickness (mm)	Absolute maximum ratings			
				Reverse voltage $V_R$ max	Power dissipation $P$ (mW)	Operating temperature $T_{opr}$ (°C)	Storage temperature $T_{stg}$ (°C)
S3590-08	Epoxy resin	10 × 10	0.3	100	100	-20 to +60	-20 to +80
S3590-09	Unsealed						
S3590-18	Epoxy resin						
S3590-19	Unsealed						

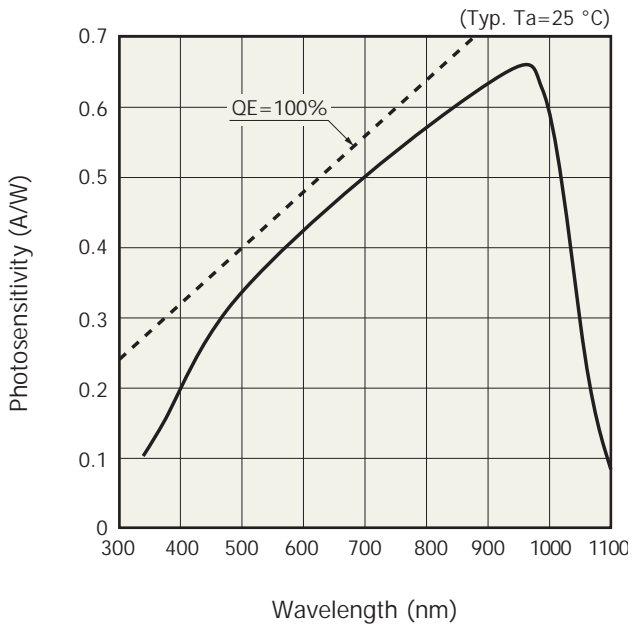
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

Type No.	Spectral response range $\lambda$ (nm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Photo sensitivity $S$				Short circuit current $I_{sc}$ 100 lx ( $\mu$ A)	Dark current $I_D$ $V_R=70$ V		Temp. coefficient of $I_D$ $T_{CID}$ $V_R=70$ V (times/°C)	Cut-off Frequency $f_c$ $V_R=70$ V (MHz)	Terminal capacitance $C_t$ $f=1$ MHz $V_R=70$ V (pF)	NEP $V_R=70$ V ( $W/Hz^{1/2}$ )	
			$\lambda=\lambda_p$ (A/W)	LSO 420 nm (A/W)	BGO 480 nm (A/W)	CsI(Tl) 540 nm (A/W)		Typ.	Max.					
S3590-08	340 to 1100	960	0.66	0.20	0.30	0.36	100	2	6	1.12	40	40	$3.8 \times 10^{-14}$	
S3590-09				0.22	0.33	0.41	90							
S3590-18				0.65	0.28	0.34	0.38	100	4					10
S3590-19				0.58	0.33	0.37	0.4	86						

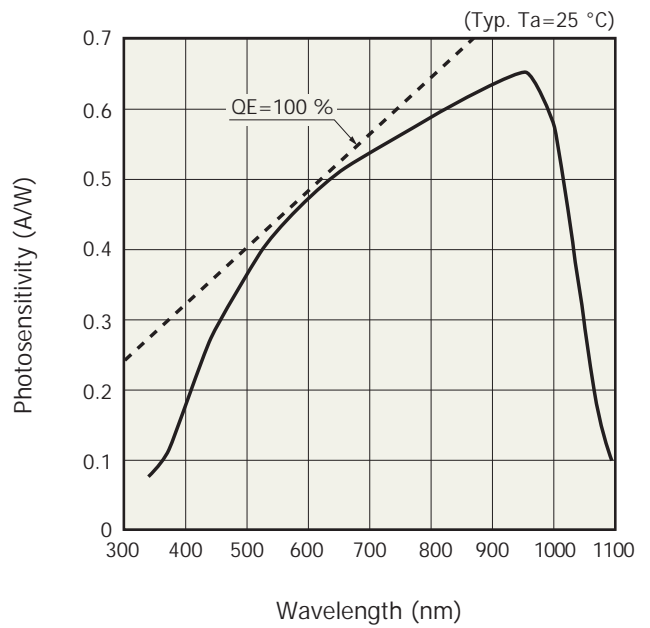
Spectral response

S3590-08



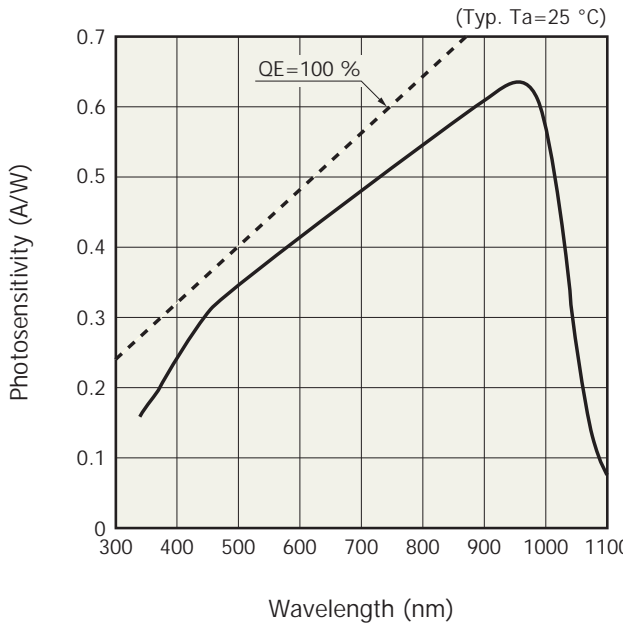
KPINB0231EC

S3590-09



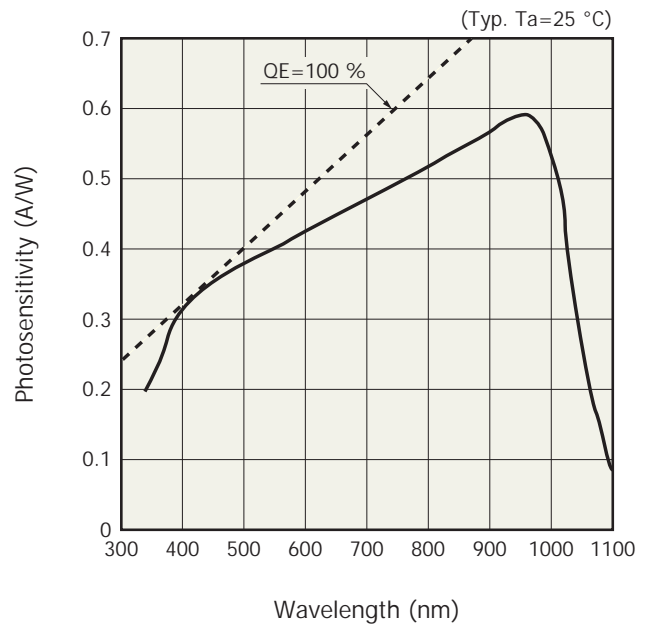
KPINB0263EC

S3590-18



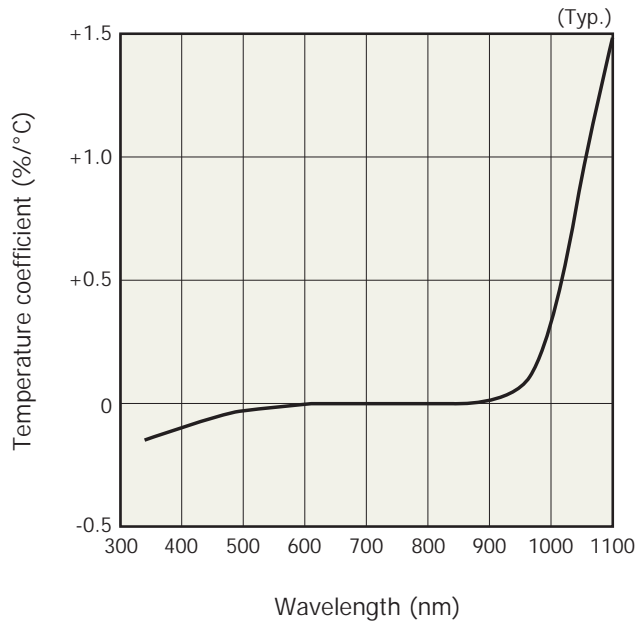
KPINB0223EC

S3590-19 (Bare chip type)

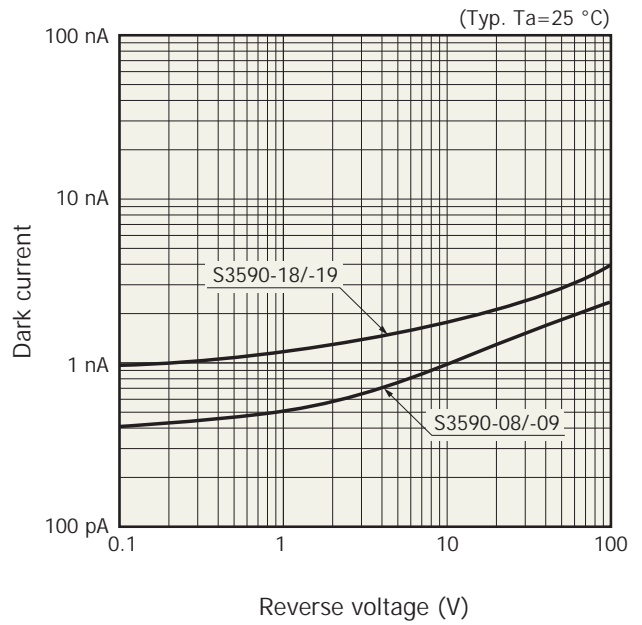


KPINB0224EC

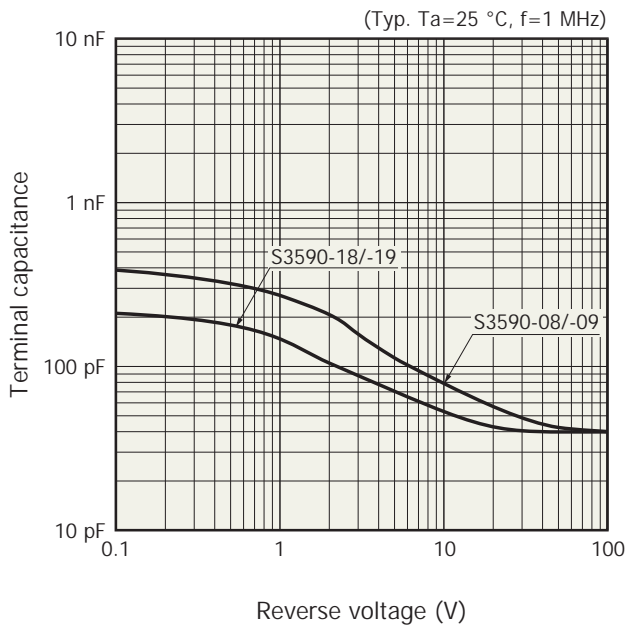
Photosensitivity temperature characteristic



Dark current vs. reverse voltage

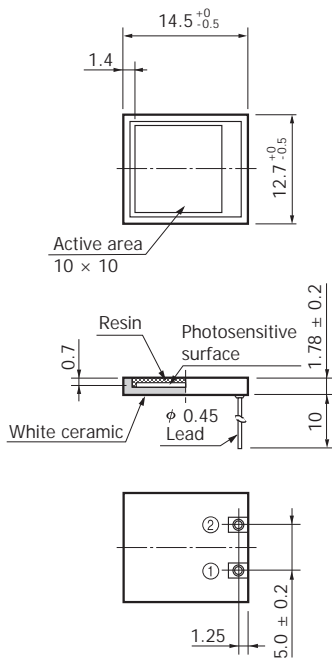


Terminal capacitance vs. reverse voltage



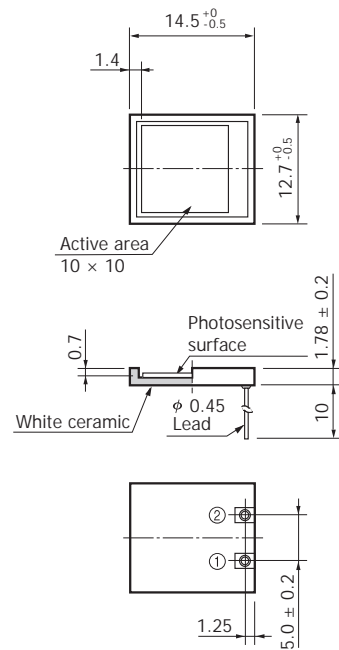
 Dimensional outline (unit: mm)

S3590-08/-18



KPINA0014EG

S3590-09/-19



KPINA0098EE

The coating resin may extend a maximum of 0.1 mm beyond the upper surface of the package.

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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# HAMAMATSU

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