

S3590 series

Large area Si PIN photodiodes

Features

- Sensitivity suitable for BGO and CsI(Tl) scintillators: S3590-08/-09
- Sensitivity suitable for 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 detection
- Hodoscopes
- TOF counters
- Radiation detection
- X-ray detection

Structure / Absolute maximum ratings

Type no.	Window material	Photosensitive area (mm)	Depletion layer thickness (mm)	Absolute maximum ratings			
				Reverse voltage V_R max (V)	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						

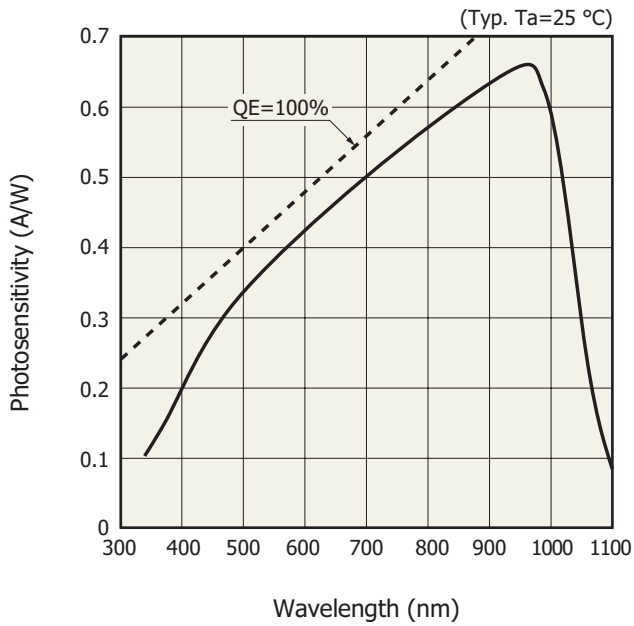
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

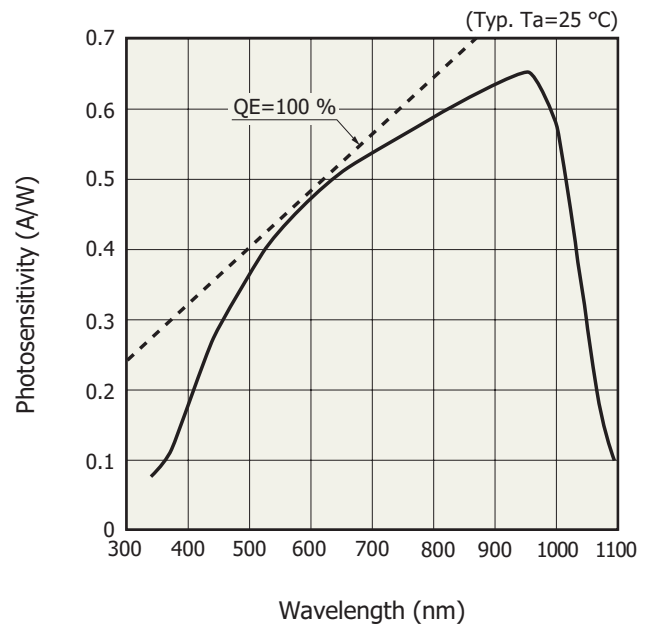
Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photosensitivity S				Short circuit current I_{sc} 100 lx (μ A)	Dark current I_D $V_R=70$ V		Temp. coefficient of I_D ΔT_{ID} $V_R=70$ V (times/°C)	Cutoff Frequency f_c $V_R=70$ V (MHz)	Terminal capacitance C_t $f=1$ MHz $V_R=70$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

Spectral response

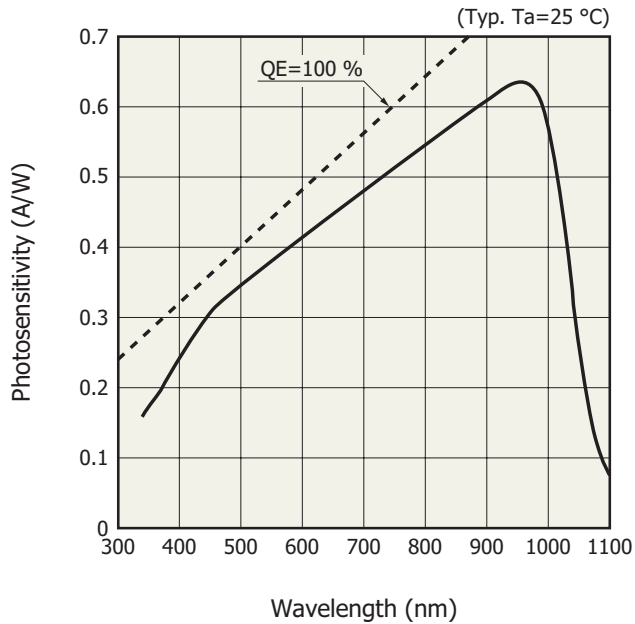
S3590-08



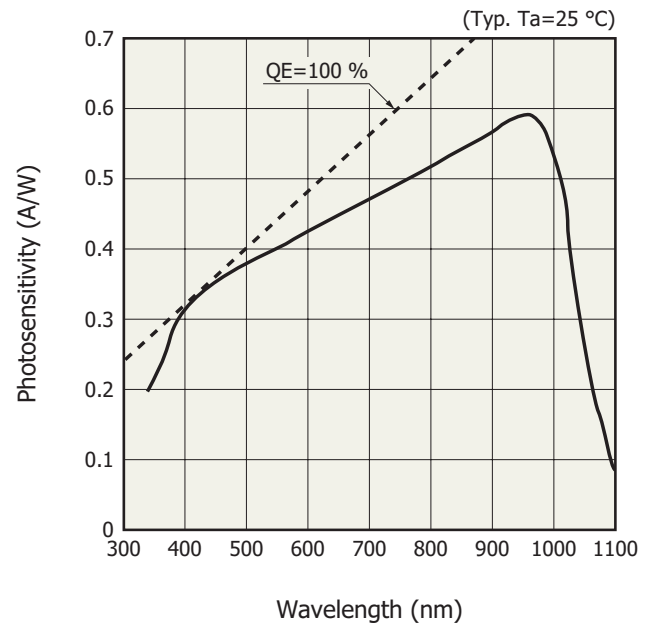
S3590-09 (Bare chip type)



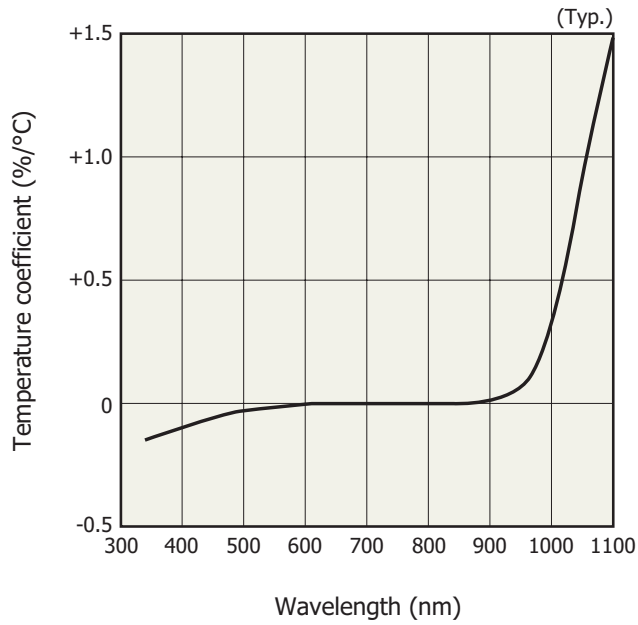
S3590-18



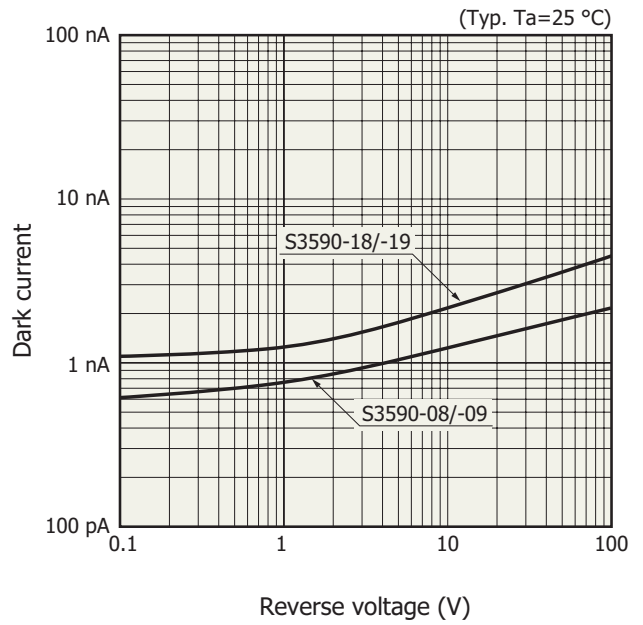
S3590-19 (Bare chip type)



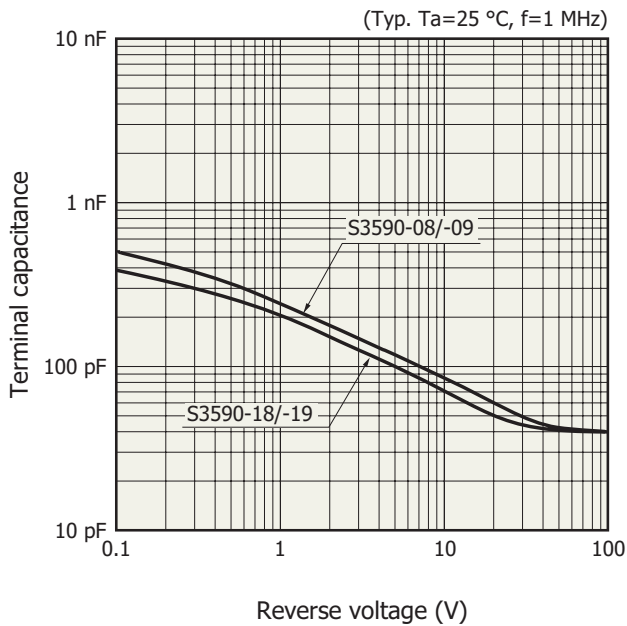
Photosensitivity temperature characteristics



Dark current vs. reverse voltage

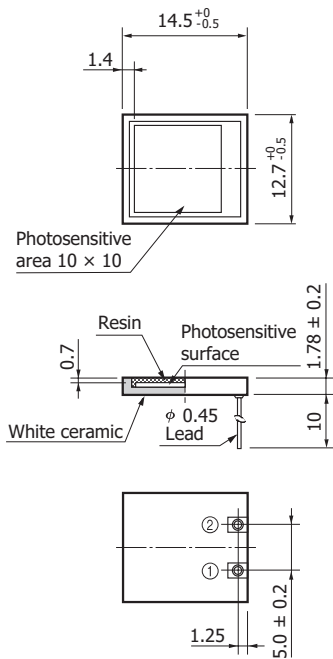


Terminal capacitance vs. reverse voltage



Dimensional outlines (unit: mm)

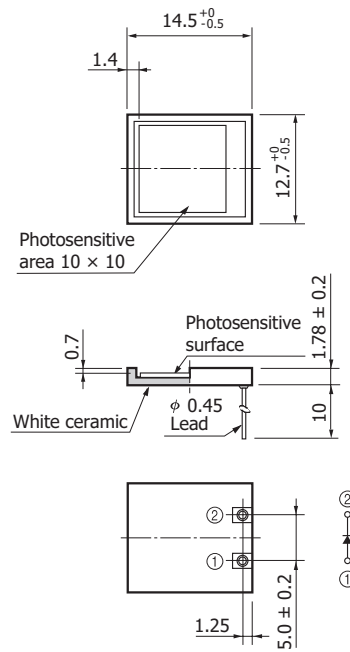
S3590-08/-18



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

KPINA0014EI

S3590-09/-19



KPINA0098EG

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

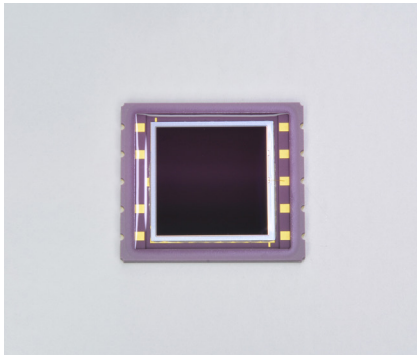
■ Precautions

- Disclaimer
- Metal, ceramic, plastic package products
- Surface mount type products

■ Technical information

- Si photodiode / Application circuit examples

Related product: Surface mount type Si PIN photodiode S12452



S12452

For the visible to near infrared region, the S12452 is available, which incorporates the S3590-08 chip into a surface mount type package (window material: silicone resin).

Information described in this material is current as of March 2020.

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.

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