

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						

* No dew condensation

When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation may cause deterioration in characteristics and reliability.

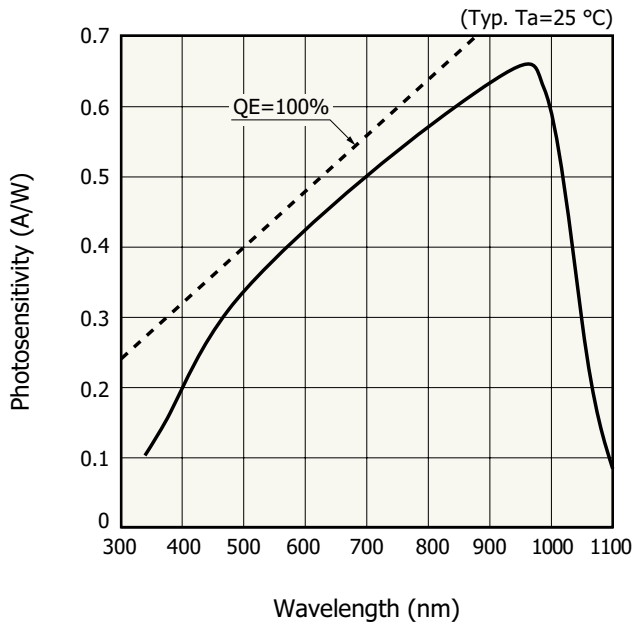
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

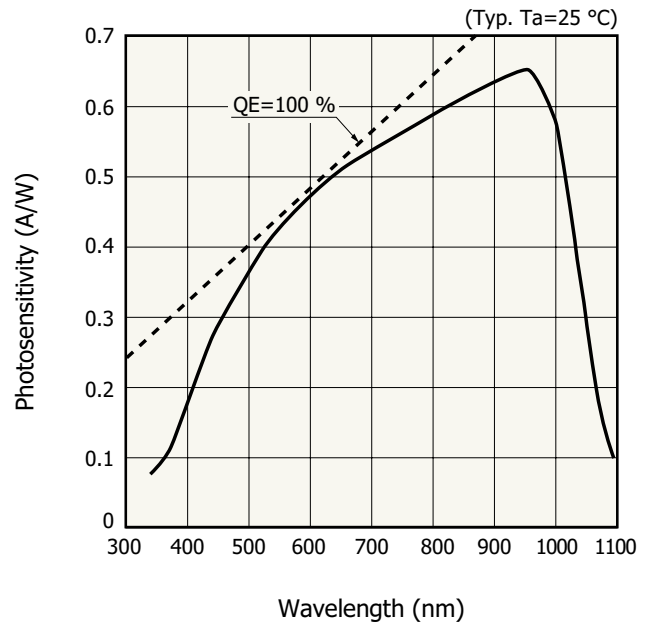
Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photosensitivity S				Short circuit current I_{sc} 100 I_x (μ A)	Dark current I_D $V_R=70$ V		Temp. coefficient of I_D $\Delta T/I_D$ $V_R=70$ V (times/°C)	Cutoff Frequency f_c $V_R=70$ V (MHz)	Terminal capacitance C_t $f=1$ 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							
S3590-18				0.65	0.28	0.34	0.38							100
S3590-19				0.58	0.33	0.37	0.4							86

Spectral response

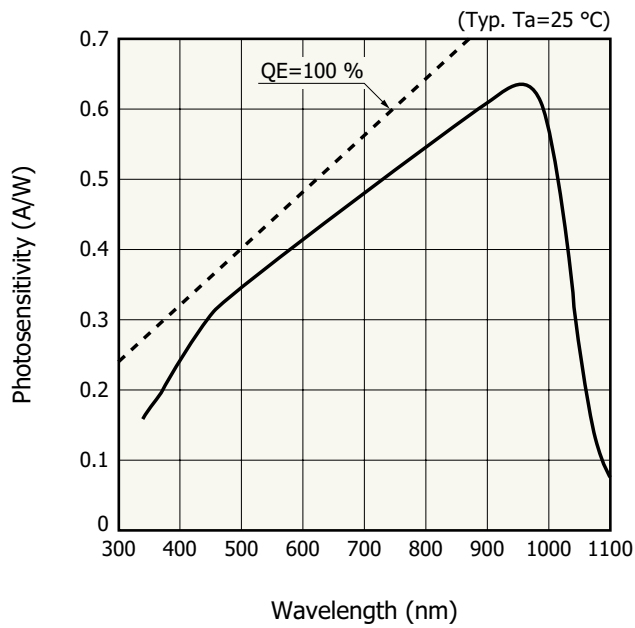
S3590-08



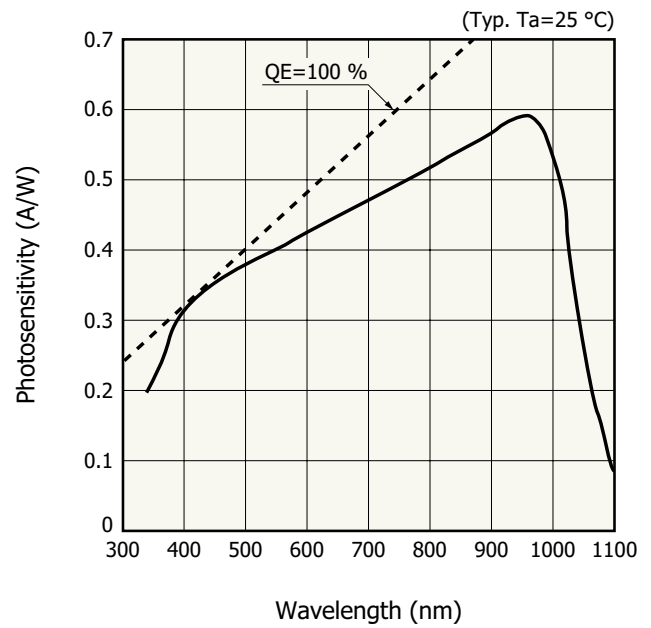
S3590-09 (Bare chip type)



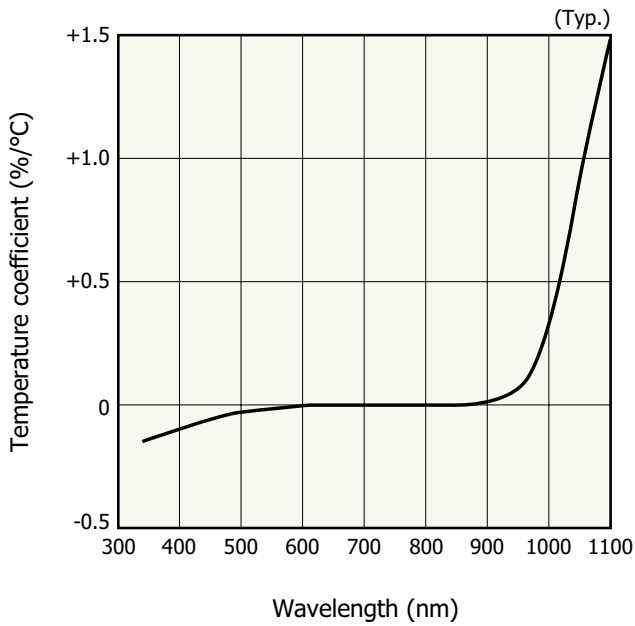
S3590-18



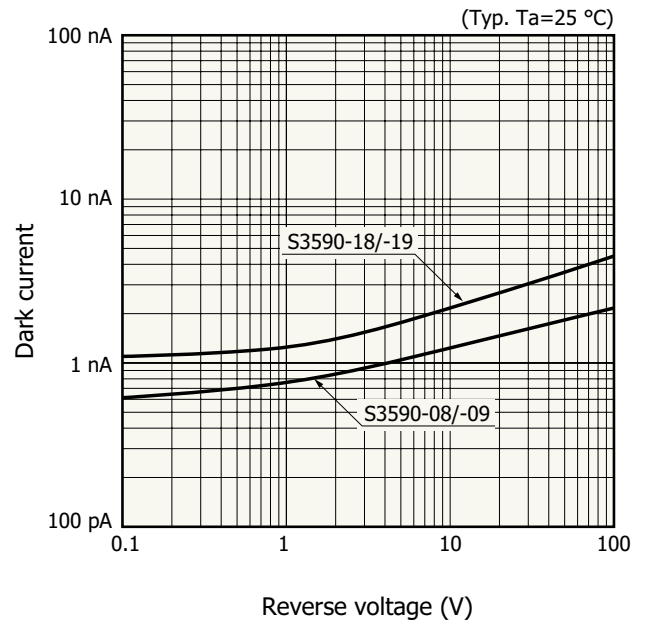
S3590-19 (Bare chip type)



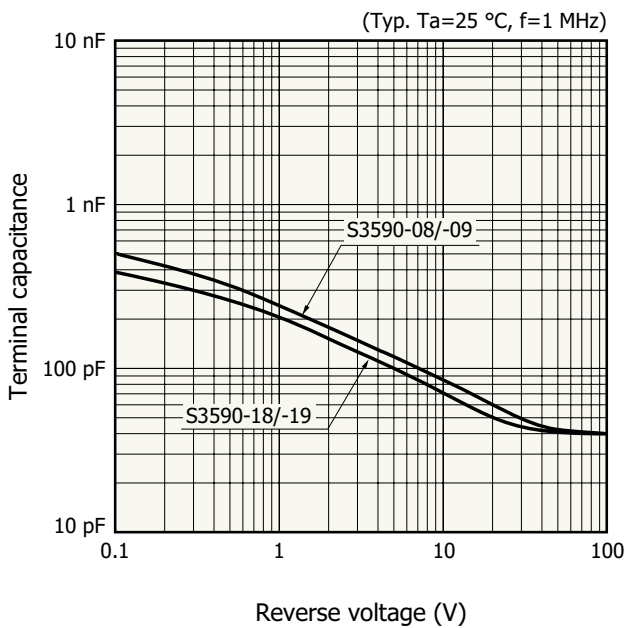
Photosensitivity temperature characteristics



Dark current vs. reverse voltage

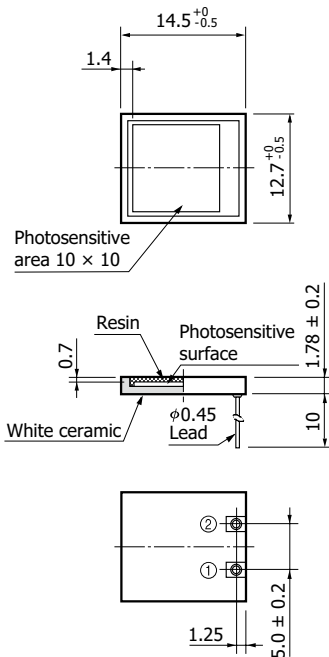


Terminal capacitance vs. reverse voltage



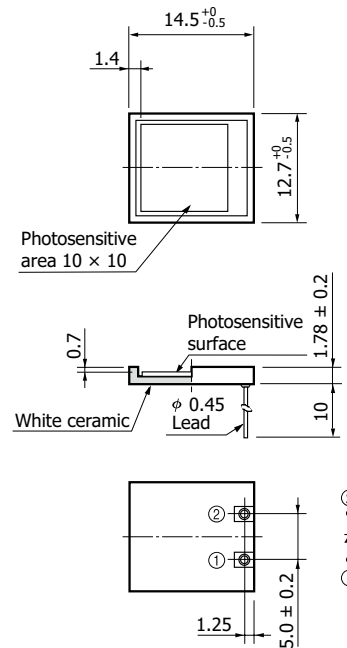
Dimensional outlines (unit: mm)

S3590-08/-18



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

S3590-09/-19



KPINA0014E1

KPINA0098E2

Related information

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

Precautions

- Disclaimer
- Metal, ceramic, plastic package products
- Unsealed products

Technical note

- Si photodiodes

Information described in this material is current as of July 2023.

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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