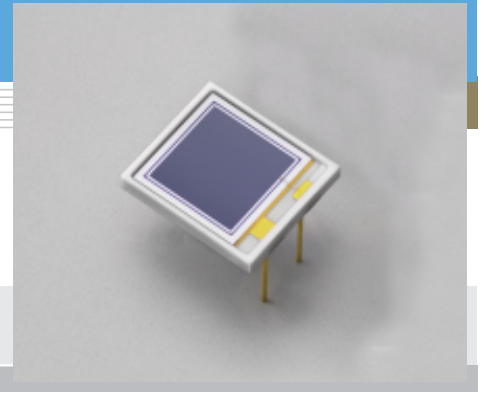


# Si PIN photodiode

## S3590-08/-09

Large area sensors for scintillation detection



### Features

- Higher sensitivity and low dark current than conventional type
- Sensitivity matching with BGO and CsI (TI) scintillators
- High quantum efficiency: QE=85 % ( $\lambda=540$  nm)
- Low capacitance
- High-speed response
- High stability
- Good energy resolution

### Applications

- Scintillation detectors
- Calorimeters
- Hodoscopes
- TOF counters
- Air shower counters
- Particle detectors, etc.

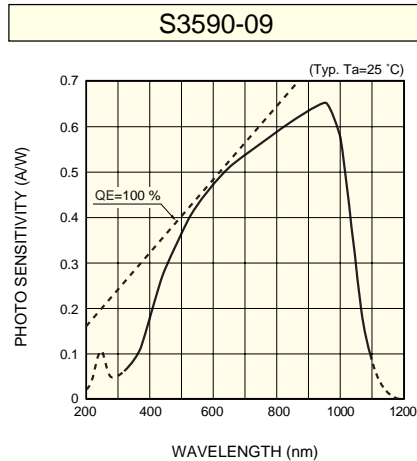
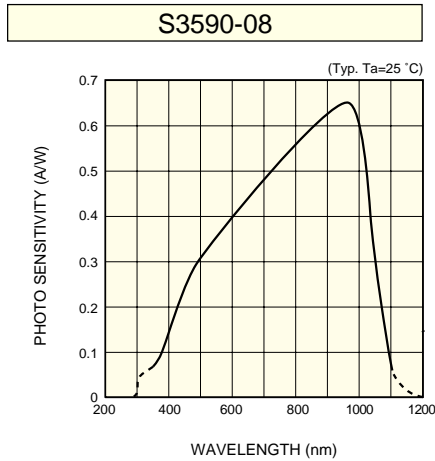
### ■ General ratings / Absolute maximum ratings

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	Window-less						

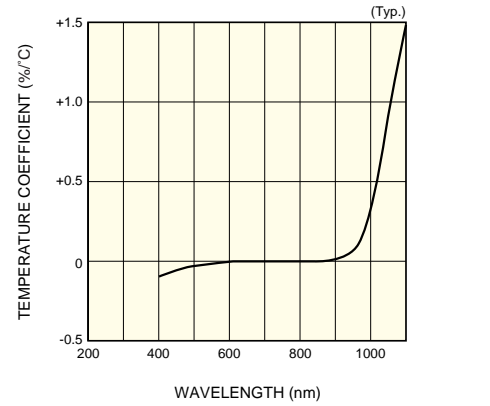
### ■ Electrical and optical characteristics (Typ. $T_a=25$ °C, unless otherwise noted)

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	320 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			0.66	0.22	0.33	0.41	90						

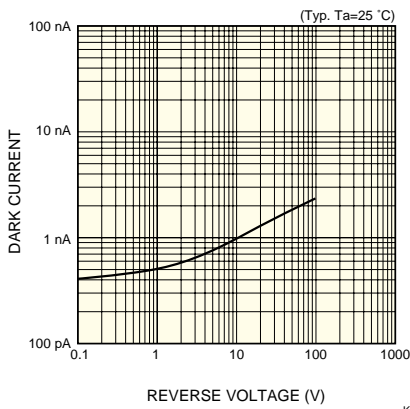
■ Spectral response



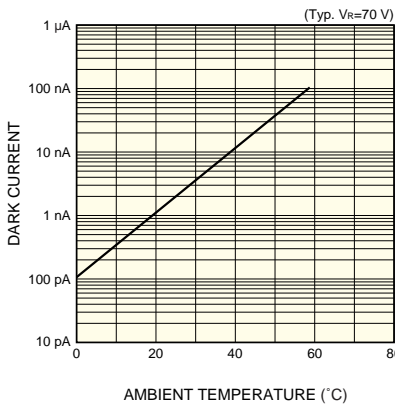
■ Photo sensitivity temperature characteristic



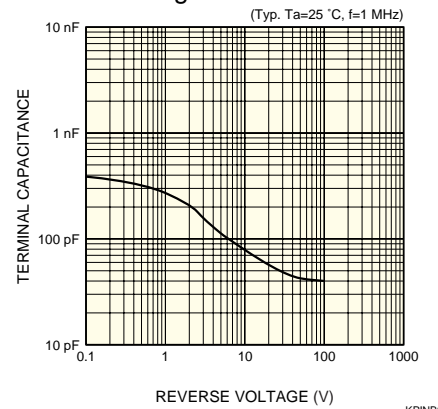
■ Dark current vs. reverse voltage



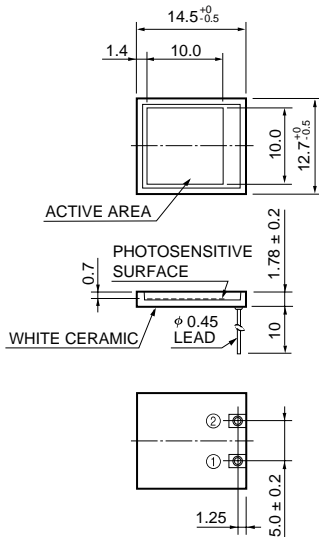
■ Dark current vs. ambient temperature



■ Terminal capacitance vs. reverse voltage



■ Dimensional outline (unit: mm)



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

KPINA0014EF



Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. Type numbers of products listed in the specification sheets or supplied as samples may have a suffix "(X)" which means tentative specifications or a suffix "(Z)" which means developmental specifications. ©2010 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184, www.hamamatsu.com

U.S.A.: Hamamatsu Corporation, 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741