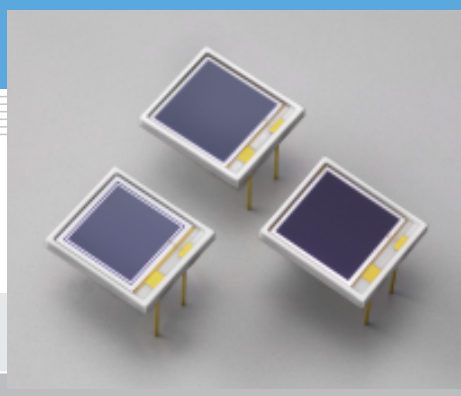


# Si PIN photodiode S3590 series

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)	Absolute maximum ratings			
			Reverse voltage VR Max.	Power dissipation P (mW)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
S3590-01	Epoxy resin	10 × 10	50	100	-20 to +60	-20 to +80
S3590-02	Window-less					
S3590-05	Epoxy resin	9 × 9	150			
S3590-06	Window-less					
S3590-08	Epoxy resin	10 × 10	100			
S3590-09	Window-less					

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

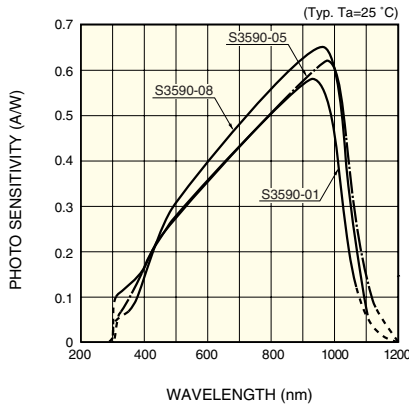
Type No.	Spectral response range $\lambda$ (nm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Photo sensitivity $S$				Short circuit current $I_{sc}$ 100 lx ( $\mu$ A)	Dark current $I_D$		Temp. coefficient of $I_D$ $T_{CID}$ (times/°C)	Cut-off Frequency $f_c$ (MHz)	Terminal capacitance $C_t$ $f=1$ MHz (pF)	NEP $V_R=70$ V (W/Hz <sup>1/2</sup> )
			$\lambda=\lambda_p$ (A/W)	LSO 420 nm (A/W)	BGO 480 nm (A/W)	CsI(Tl) 540 nm (A/W)		Typ.	Max.				
S3590-01	320 to 1060	920	0.58	0.19	0.26	0.31	80	1.5 *1	5 *1	1.12	35 *1	75 *1	$3.9 \times 10^{-14}$
S3590-02			0.62	0.23	0.32	0.39							
S3590-05	320 to 1120	980	0.62	0.19	0.25	0.30	77	8 *2	30 *2		20 *2	25 *2	$8.4 \times 10^{-14}$
S3590-06			0.64	0.23	0.32	0.39							
S3590-08	320 to 1100	960	0.66	0.20	0.30	0.36	100	2 *3	6 *3		40 *3	40 *3	$3.8 \times 10^{-14}$
S3590-09			0.66	0.22	0.33	0.41							

\*1:  $V_R=30$  V

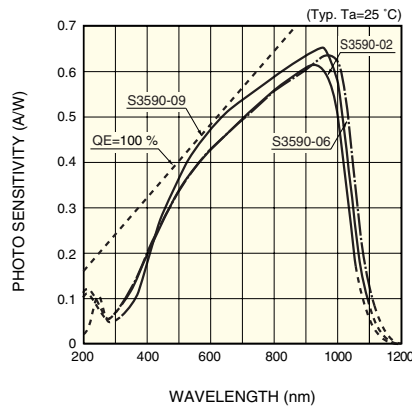
\*2:  $V_R=100$  V

\*3:  $V_R=70$  V

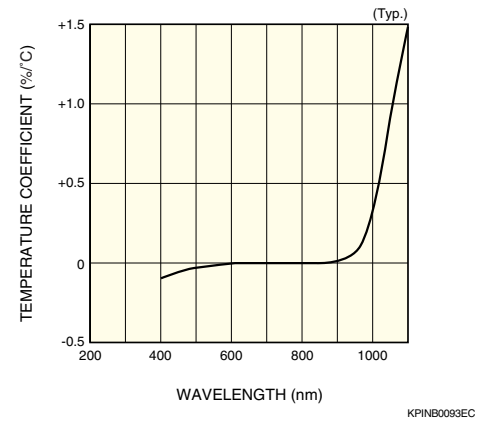
## Spectral response



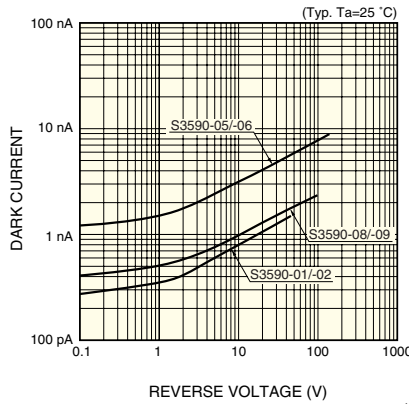
## Spectral response (without window)



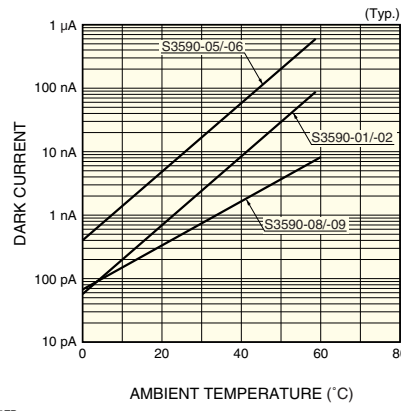
## Photo sensitivity temperature characteristic



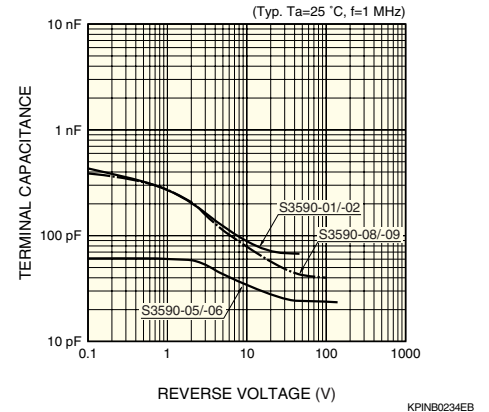
## Dark current vs. reverse voltage



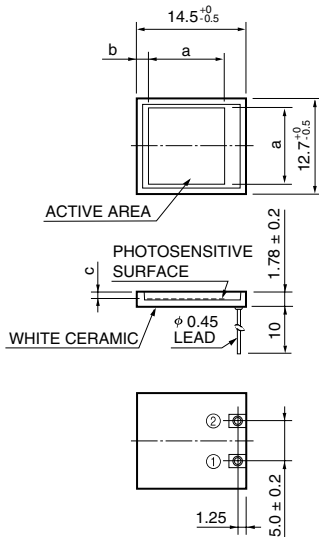
## Dark current vs. ambient temperature



## 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.

	-01	-05	-08
a	10.0	9.0	10.0
b	1.4	1.9	1.4
c	0.8	0.5	0.7

KPINA0014EE

**HAMAMATSU**

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Hamamatsu City, 435-8558 Japan, Telephone: (81) 053-434-3311, Fax: (81) 053-434-5184, <http://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) 08152-3750, Fax: (49) 08152-2658

France: Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trappu, 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

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