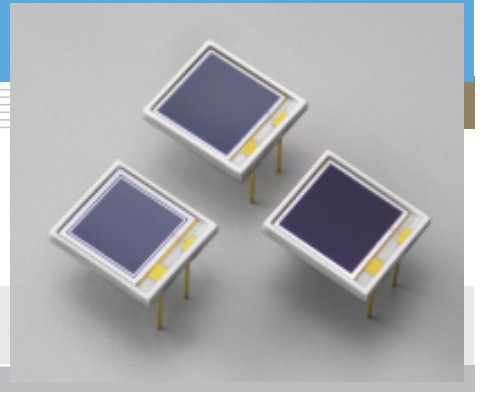


# Si PIN photodiode

## S3590-01/-05/-08

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 $V_R$ Max. (V)	Power dissipation P (mW)	Operating temperature $T_{opr}$ (°C)	Storage temperature $T_{stg}$ (°C)
S3590-01	Epoxy resin	10 × 10	50	100	-20 to +60	-20 to +80
S3590-05		9 × 9	150			
S3590-08		10 × 10	100			

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

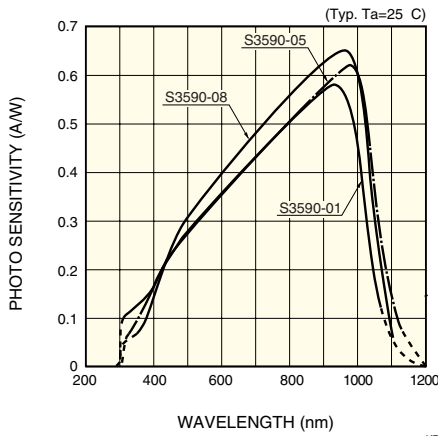
Type No.	Spectral response range $\lambda$ (nm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Photo sensitivity S				Short circuit current $I_{sc}$ 100 lx ( $\mu$ A)	Dark current $I_D$		Temp. coefficient of $I_D$ $T_{CID}$ (times/°C)	Cut-off frequency $f_c$ (MHz)	Terminal capacitance $C_t$ f=1 MHz (pF)	NEP $V_R=70$ V (W/Hz <sup>1/2</sup> )
			Peak (A/W)	LSO 420 nm (A/W)	BGO 480 nm (A/W)	CsI (TI) 540 nm (A/W)		Typ. (nA)	Max. (nA)				
S3590-01	320 to 1060	920	0.56	0.19	0.26	0.31	80	1.5 * <sup>1</sup>	5 * <sup>1</sup>	1.12	35 * <sup>1</sup>	75 * <sup>1</sup>	$3.9 \times 10^{-14}$
S3590-05	320 to 1120	980	0.60	0.19	0.25	0.30	77	8 * <sup>2</sup>	30 * <sup>2</sup>		20 * <sup>2</sup>	25 * <sup>2</sup>	$8.4 \times 10^{-14}$
S3590-08	320 to 1100	960	0.66	0.20	0.30	0.36	100	2 * <sup>3</sup>	6 * <sup>3</sup>		40 * <sup>3</sup>	40 * <sup>3</sup>	$3.8 \times 10^{-14}$

\*1:  $V_R=30$  V

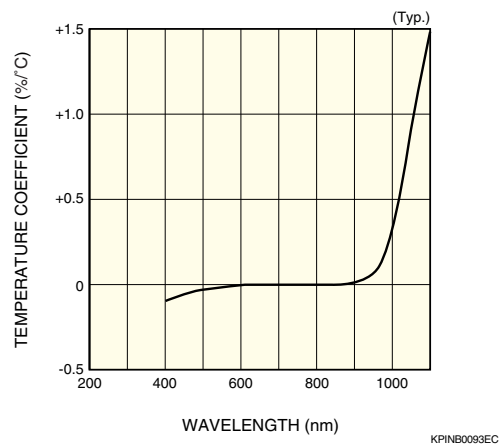
\*2:  $V_R=100$  V

\*3:  $V_R=70$  V

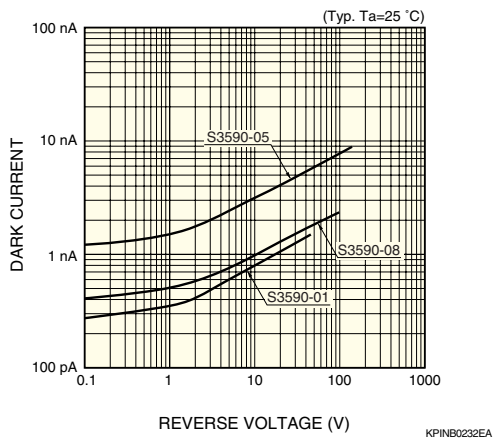
## Spectral response



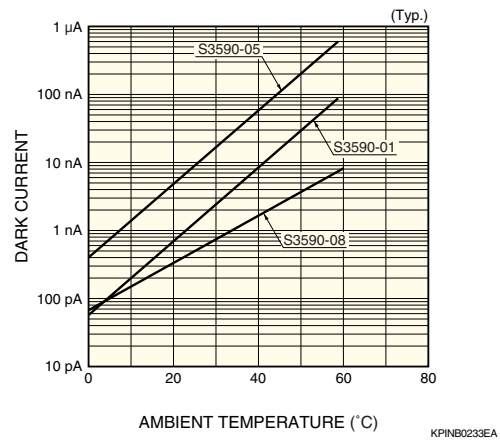
## Photo sensitivity temperature characteristic



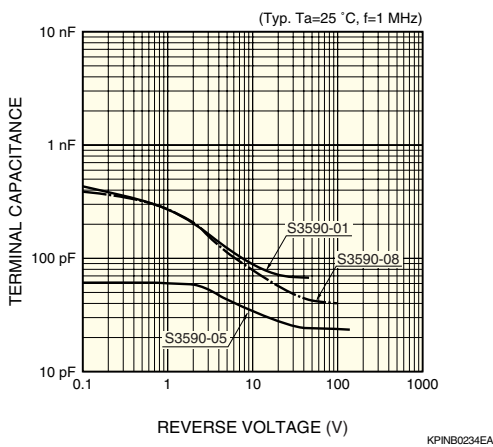
## Dark current vs. reverse voltage



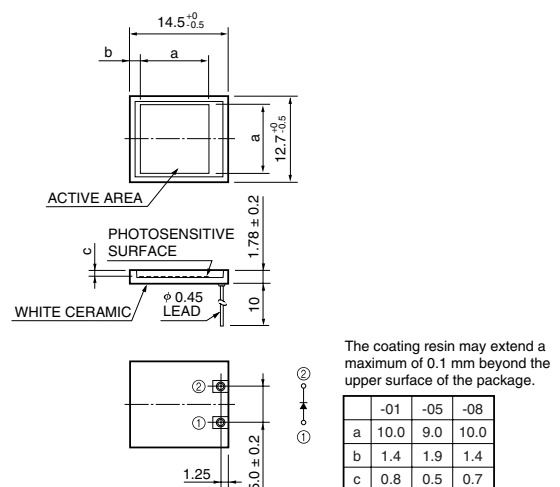
## Dark current vs. ambient temperature



## Terminal capacitance vs. reverse voltage



## Dimensional outline (unit: mm)



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