

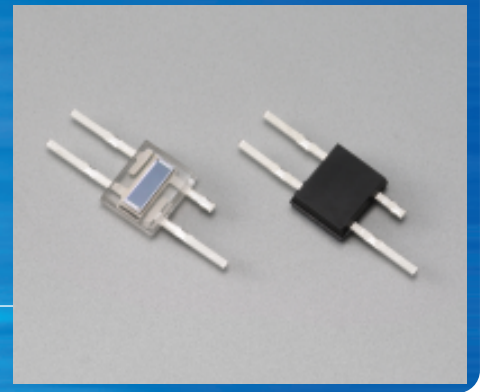
**NEW**

PSD

# One-dimensional PSD

## S8301 series

### Nonlinear output PSD



S8301 is a nonlinear output PSD (Position Sensitive Detector) specifically developed to improve accuracy of triangular measurement over long distances.

#### Features

- Nonlinear output one-dimensional PSD
- Large signal output change level for long distances
- Active area: 1.0 × 3.2 mm (resistance length 3.0 mm)

#### Applications

- Displacement meter
- Optical switch

#### ■ Absolute maximum ratings (Ta=25 °C)

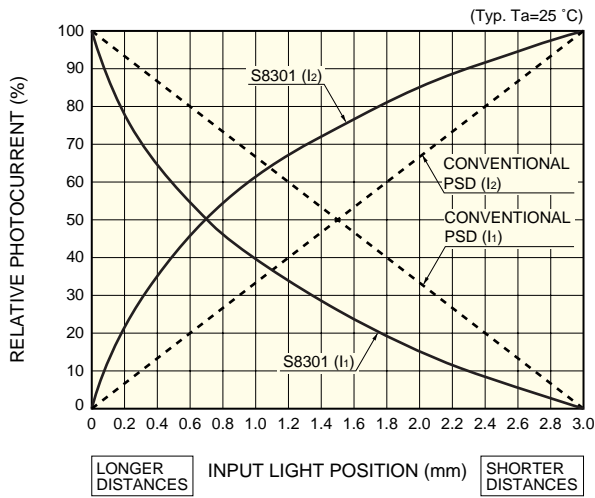
Parameter	Symbol	Value	Unit
Reverse voltage	V <sub>R</sub> Max.	20	V
Operating temperature	T <sub>opr</sub>	-25 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +100	°C

#### ■ Electrical and optical characteristics (Ta=25 °C)

Parameter	Symbol	Condition	S8301			S8301-01			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Spectral response range	$\lambda$		-	320 to 1100	-	-	760 to 1100	-	nm
Peak sensitivity wavelength	$\lambda_p$		-	960	-	-	960	-	nm
Photo sensitivity	S	$\lambda = \lambda_p$	-	0.55	-	-	0.55	-	A/W
Interelectrode resistance	R <sub>ie</sub>	V <sub>b</sub> =0.1 V	180	250	320	180	250	320	k $\Omega$
Position detection error	-	V <sub>R</sub> =1 V Spot light size= $\phi$ 0.1 mm 50 to 2950 $\mu$ m range	-	$\pm$ 30	$\pm$ 60	-	$\pm$ 30	$\pm$ 60	$\mu$ m
Saturation current	I <sub>st</sub>	V <sub>R</sub> =1 V, R <sub>L</sub> =1 k $\Omega$	20	-	-	20	-	-	$\mu$ A
Dark current	I <sub>D</sub>	V <sub>R</sub> =1 V	-	0.1	2	-	0.1	2	nA
Temperature coefficient of I <sub>D</sub>	-		-	1.15	-	-	1.15	-	times/°C
Rise time	t <sub>r</sub>	V <sub>R</sub> =1 V, R <sub>L</sub> =1 k $\Omega$ *	-	5	15	-	10	30	$\mu$ s
Terminal capacitance	C <sub>t</sub>	V <sub>R</sub> =1 V, f=10 kHz	-	35	70	-	35	70	pF

\* S8301:  $\lambda$ =650 nm, S8301-01:  $\lambda$ =890 nm

## Photocurrent vs. input light position



## Operation expression

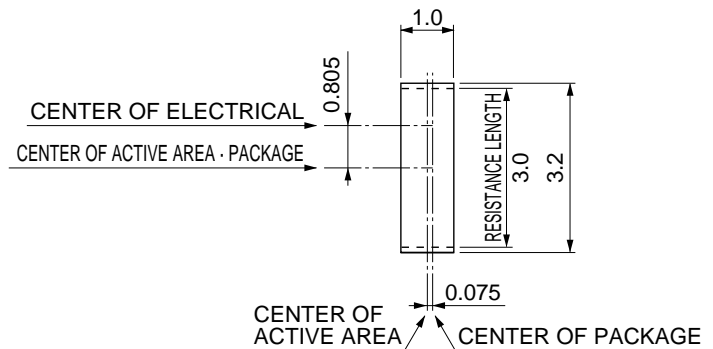
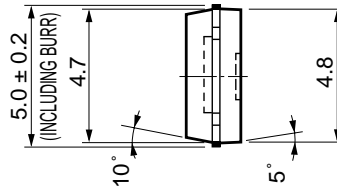
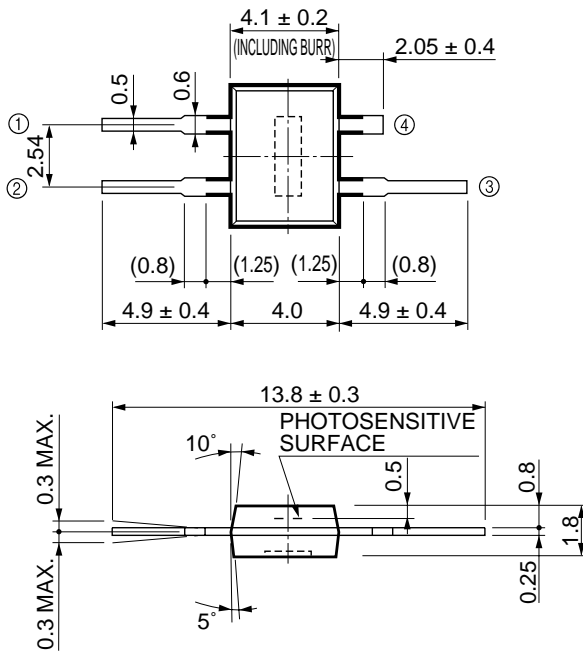
$$\text{Input light position } (\mu\text{m}) = 10^n - a$$

$$n = \frac{\log |a| \cdot I_1 + \log |L + a| \cdot I_2}{I_1 + I_2}$$

$$L = 3000$$

$$a = 300$$

## Dimensional outline (unit: mm)



- ① ANODE 1
- ② CATHODE (COMMON)
- ③ ANODE 2
- ④ CATHODE (COMMON); DISPLAY FOR LONGER DISTANCES

DETAILS OF PHOTODIODE

KPSDA0065EA

# HAMAMATSU

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