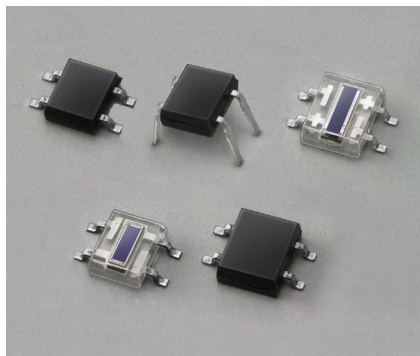


One-dimensional PSD



Plastic package

1-D PSD with small plastic package

Hamamatsu offers a variety of 1-D PSDs (position sensitive detectors) molded into plastic packages. These PSDs feature excellent position detection resolution, high resistance to disturbance background light and high reliability.

Features

- Excellent position detection resolution
- High reliability
- Thin, miniature plastic package
- Clear package passing wide wavelength range or visible-cut package reducing background light noise
- Surface mount packages are available.
- High interelectrode resistance: S3274-05, S7105-05

Applications

- Auto focus camera
- Range finders
- Optical proximity switches
- Displacement meters

Structure / Absolute maximum ratings

Type no.	Package	Dimensional outline	Photosensitive area (mm)	Resistance length (mm)	Absolute maximum ratings		
					Reverse voltage Vr max (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
S4583-04	Surface mount type, visible-cut	(1)	1 × 3	3	20	-25 to +85	-40 to +100
S4584-04		(1)	1 × 3.5	3.5			
S4584-06	Surface mount type, clear	(2)					
S3274-05	DIP type, visible-cut	(3)					
S7105-04	Surface mount type, visible-cut	(3)	1 × 4.2	4.2			
S7105-06	Surface mount type, clear						
S7105-05	Surface mount type, visible-cut						

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.

This product does not support lead-free soldering. For details on reflow soldering conditions for surface-mount components, please contact our sales office.

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

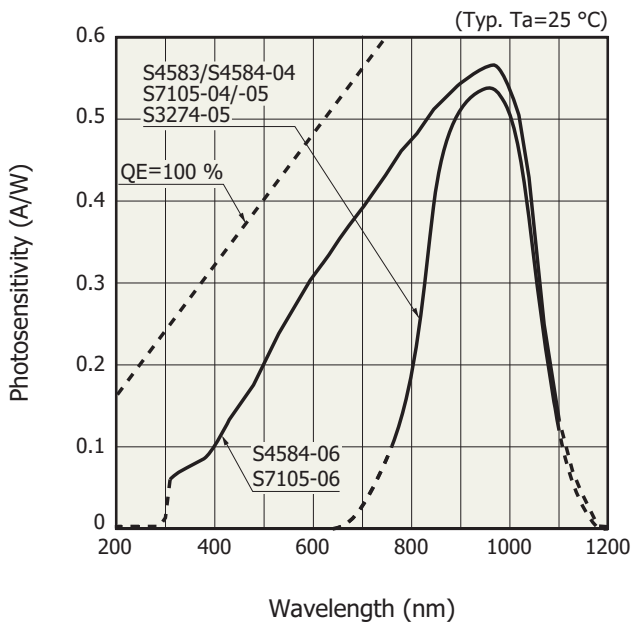
Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photosensitivity S		Interelectrode resistance Rie Vb=0.1 V			Position detection error *1 VR=1 V Light spot size= ϕ 300 μ m		Saturation photocurrent *2 Ist VR=1 V RL=1 k Ω (μ A)	Dark current ID VR=1 V		Temp. coefficient of ID TCID (times/ $^{\circ}$ C)	Rise time *3 tr VR=1 V RL=1 k Ω (μ s)		Terminal capacitance Ct VR=1 V f=10 kHz (pF)
			$\lambda=650$ nm (A/W)	$\lambda=890$ nm (A/W)	Min. (k Ω)	Typ. (k Ω)	Max. (k Ω)	Typ. (μ m)	Max. (μ m)		Typ. (nA)	Max. (nA)		$\lambda=650$ nm (μ s)	$\lambda=890$ nm (μ s)	
			S4583-04	760 to 1100	960	-	0.51	100	140	180	\pm 10	\pm 30	30	0.05	1	1.15
S4584-04	760 to 1100	960	-	0.51	100	140	180	\pm 15	\pm 35	30	0.05	1	1.15	-	10	15
S4584-06	320 to 1100		0.38	0.55										3		
S3274-05	760 to 1100		-	0.51										320		
S7105-04	760 to 1100	960	-	0.51	100	140	180	\pm 15	\pm 40	30	0.1	2	1.15	-	5	40
S7105-06	320 to 1100		0.38	0.55										2		
S7105-05	760 to 1100		-	0.51										320		

*1: In the range 75% from the center of the photosensitive area to the edge

*2: This indicates the upper limit of the photocurrent linearity over the entire incident light quantity and is defined as the photocurrent at a point where the linearity deviates by 10%.

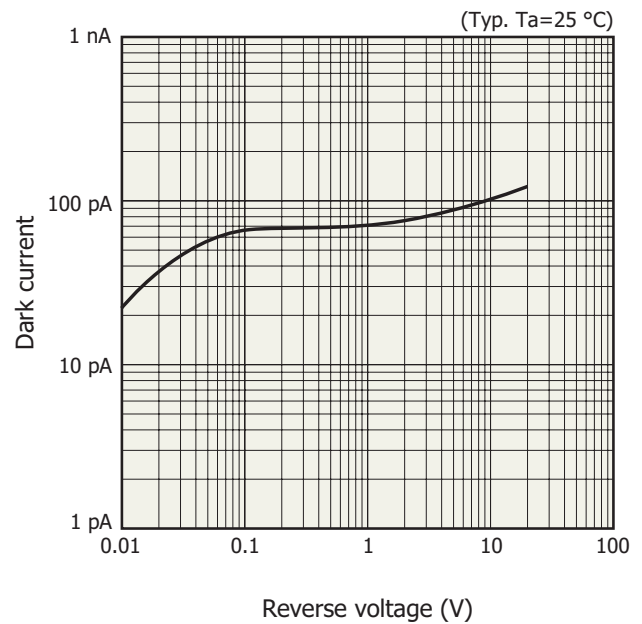
*3: Time required for output change from 10 to 90% of the steady output value when stepped function light is input to the PSD

Spectral response



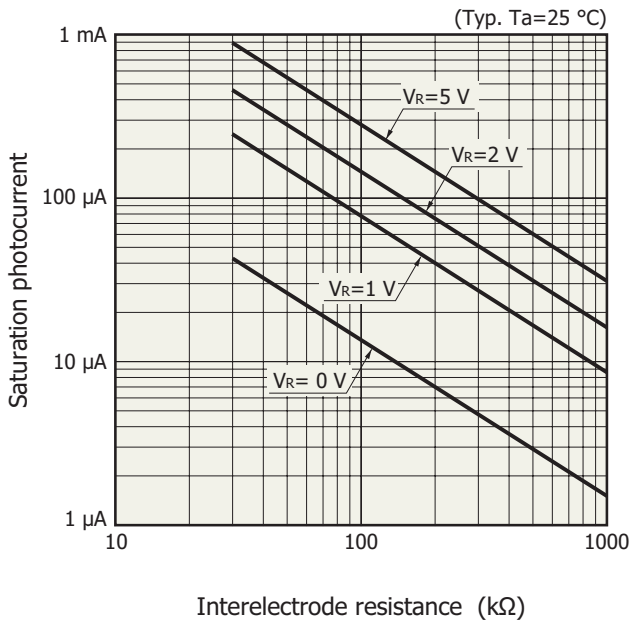
KPSDB0079ED

Dark current vs. reverse voltage



KPSDB0004EG

❑ Saturation photocurrent vs. interelectrode resistance



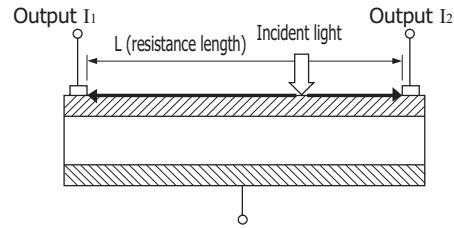
KPSDB0003EA

❑ Definition of position detection error

When the electrical center of a PSD is assumed to be the position of incident light where light current I1 equals I2, position detection error at each incident position can be defined by the following equation.

$$\text{Position detection error } (\mu\text{m}) = \text{Incident position} - \frac{I_2 - I_1}{I_1 + I_2} \times \frac{L}{2}$$

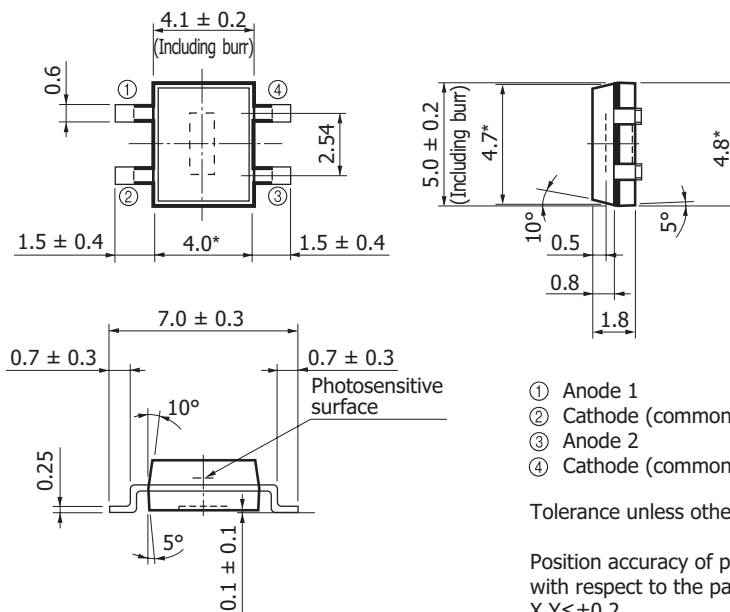
The electrical center is viewed as 0, I1 as (+), and I2 as (-).



KPSDC0001EA

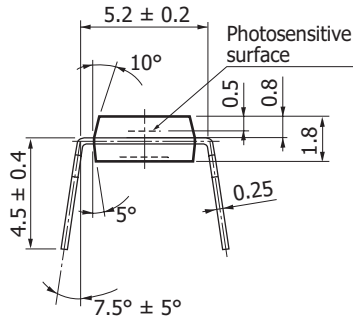
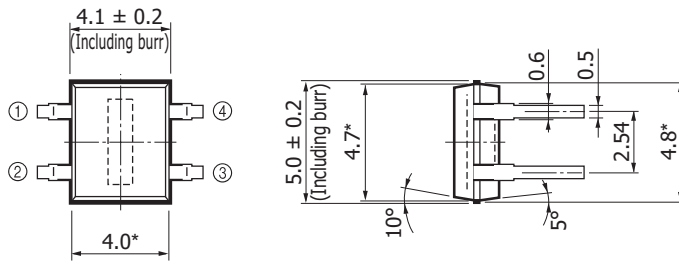
❑ Dimensional outlines (unit: mm)

(1) S4583-04, S4584-04/-06 (Surface mount type)



KPSDA0002EA

(2) S3274-05



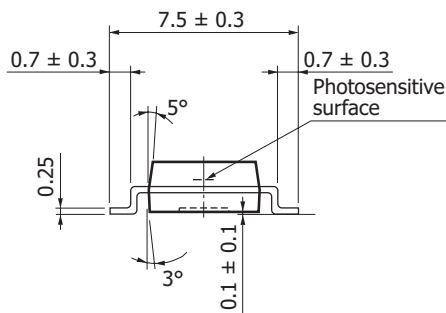
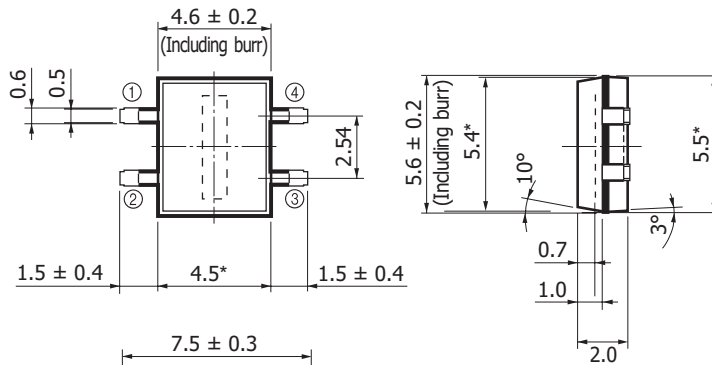
- ① Anode 1
- ② Cathode (common)
- ③ Anode 2
- ④ Cathode (common)

Tolerance unless otherwise noted: ± 0.1

Position accuracy of photosensitive area center with respect to the package dimensions marked *
 $X, Y \leq \pm 0.2$
 $\theta \leq \pm 2^\circ$

KPSDA0063EA

(3) S7105-04/-05/-06 (Surface mount type)



- ① Anode 1
- ② Cathode (common)
- ③ Anode 2
- ④ Cathode (common)

Tolerance unless otherwise noted: ± 0.1

Position accuracy of photosensitive area center with respect to the package dimensions marked *
 $X, Y \leq \pm 0.2$
 $\theta \leq \pm 2^\circ$

KPSDA0047EA

Related information

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

■ Precautions

- Disclaimer
- Metal, ceramic, plastic package products
- Surface mount type products

■ Technical information

- PSD

Information described in this material is current as of April 2019.

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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