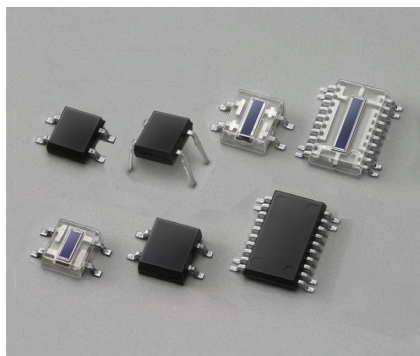


One-dimensional PSD



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, S5629-02

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 V _R max (V)	Operating temperature T _{opr} (°C)	Storage temperature T _{stg} (°C)
S4581-04	Surface mount type, visible-cut	(1)	1 × 2	2	20	-25 to +85	-40 to +100
S4583-04		(1)	1 × 3	3			
S4584-04		(1)	1 × 3.5	3.5			
S4584-06	Surface mount type, clear						
S3274-05	DIP type, visible-cut	(2)	1 × 4.2	4.2			
S7105-04	Surface mount type, visible-cut	(3)					
S7105-06	Surface mount type, clear	(3)					
S7105-05	Surface mount type, visible-cut	(4)	1 × 6	6			
S5629	Surface mount type, visible-cut						
S5629-01	Surface mount type, clear						
S5629-02	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)

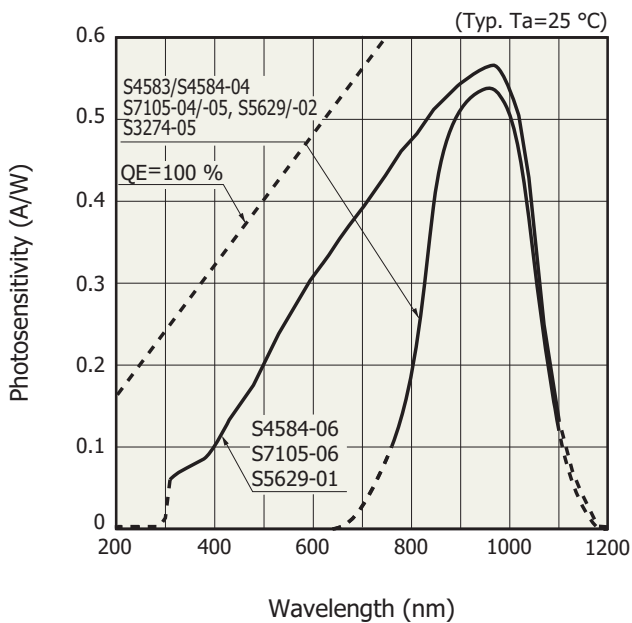
Type no.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photosensitivity S		Interelectrode resistance Rie Vb=0.1 V			Position detection error *1 VR=1 V Light spot size= ϕ 300 μ m		Saturation photocurrent *2 Ist VR=1 V RL=1 k Ω (μ A)	Dark current ID VR=1 V		Temp. coefficient of ID 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)	
			S4581-04	760 to 1060	920	-	0.51	100	140		180	\pm 10		\pm 20	30	
S4583-04	760 to 1100	960	-	0.51	100	140	180	\pm 10	\pm 30	30	0.05	1	1.15	-	10	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		0.33		320	400	480			15				3		
S3274-05	760 to 1100		-		-	-	-			-				-		
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	320	400	480			2						
S7105-05	760 to 1100		-	0.51	320	400	480			-						
S5629	760 to 1100	960	-	0.51	30	50	80	\pm 20	\pm 60	80	0.1	2	1.15	-	5	60
S5629-01	320 to 1100		0.38	0.55	30	50	80			2						
S5629-02	760 to 1100		-	0.51	240	300	360			-						

*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%.

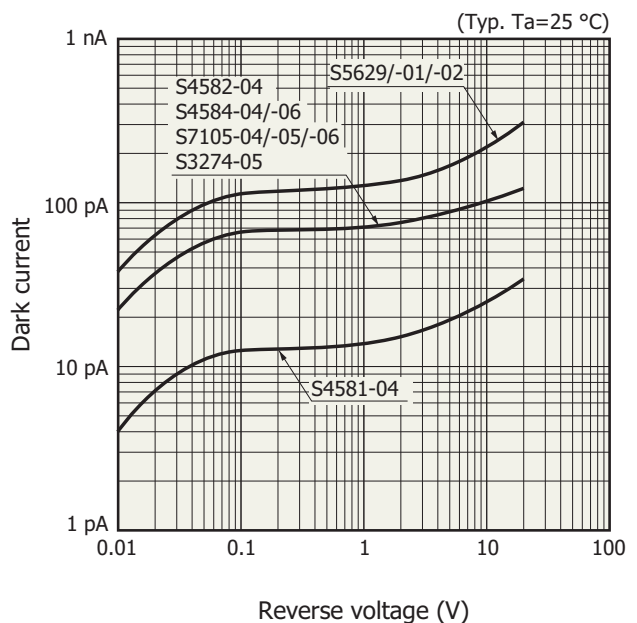
*3: Time required for output change from 10 to 90% of the steady output value when stepped function light is input to the PSD

Spectral response



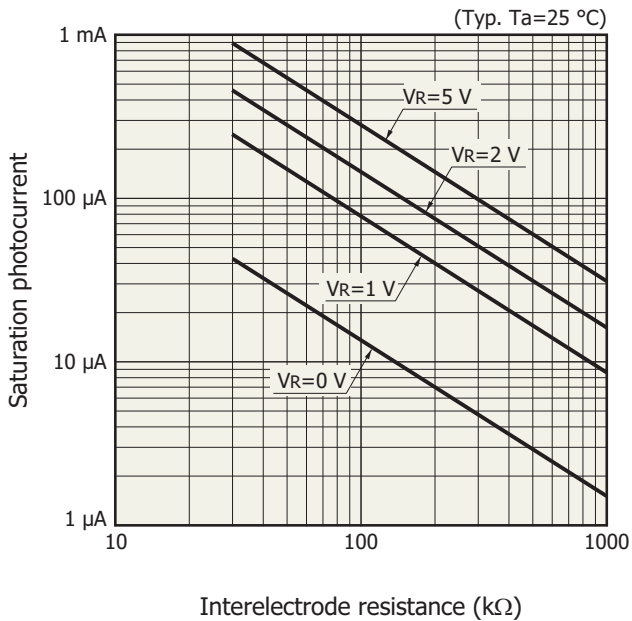
KPSDB0079EC

Dark current vs. reverse voltage



KPSDB0004EF

❑ Saturation photocurrent vs. interelectrode resistance



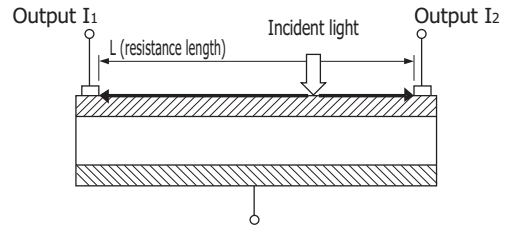
KPSDB0003EA

❑ 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.

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

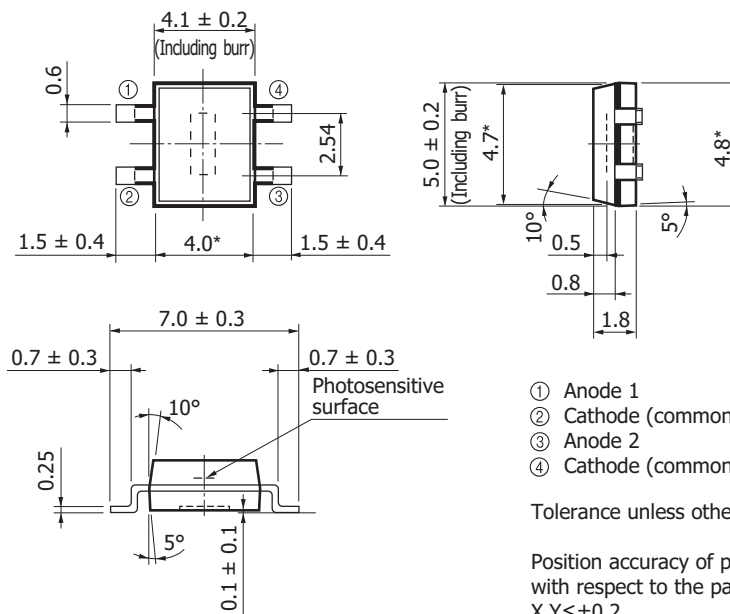
The electrical center is viewed as 0, I1 as (+), and I2 as (-).



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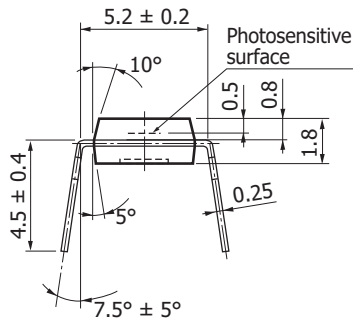
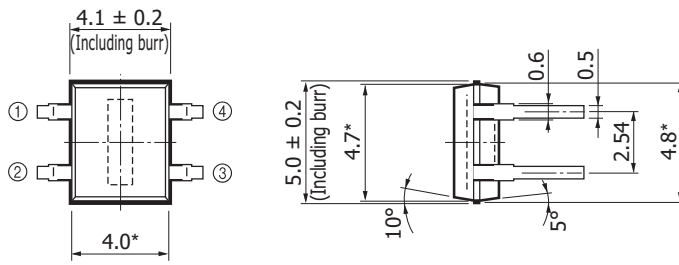
❑ Dimensional outlines (unit: mm)

(1) S4581-04, S4583-04, S4584-04/-06 (Surface mount type)



KPSDA0002EA

(2) S3274-05



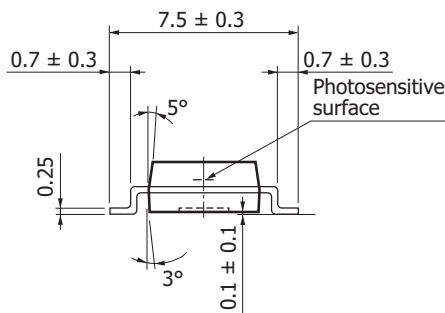
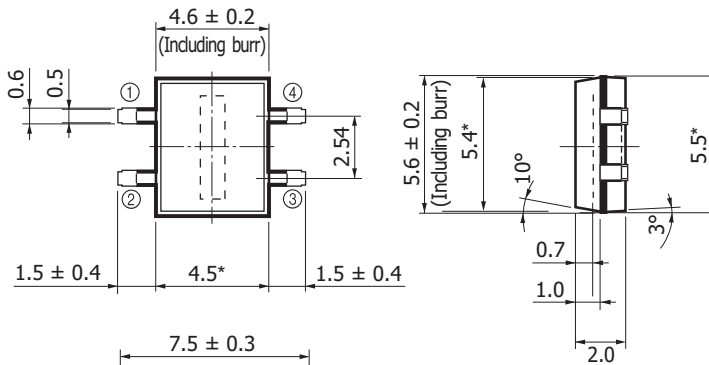
- ① Anode 1
- ② Cathode (common)
- ③ Anode 2
- ④ Cathode (common)

Tolerance unless otherwise noted: ± 0.1

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

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



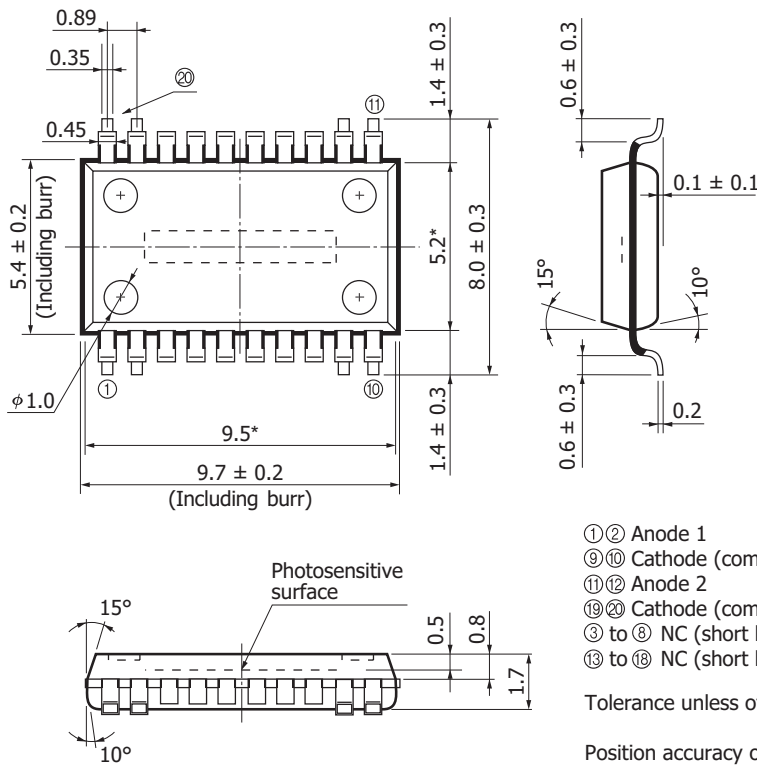
- ① Anode 1
- ② Cathode (common)
- ③ Anode 2
- ④ Cathode (common)

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

(4) S5629/-01/-02 (Surface mount type)



- ①② Anode 1
- ⑨⑩ Cathode (common)
- ⑪⑫ Anode 2
- ⑬⑭ Cathode (common)
- ③ to ⑧ NC (short lead)
- ⑮ to ⑰ NC (short lead)

Tolerance unless otherwise noted: ± 0.1

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

KPSDA0023EA

Related information

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

Precautions

- Notice
- Metal, ceramic, plastic package products/Precautions
- Surface mount type products/Precautions

Technical information

- PSD/Technical information

Information described in this material is current as of September, 2013.

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Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental specifications.

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