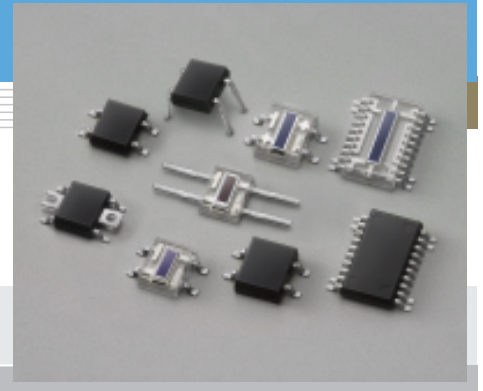


One-dimensional PSD Plastic package

1-D PSD with 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 package is available
- Suitable for high-speed, microscopic spot light: S7879, S8361
- High sensitivity in the red region: S8361
- High interelectrode resistance: S3271 to S3274-05 S7105-05, S5629-02

Applications

- Camera auto focus
- Range finder
- Optical proximity switch
- Displacement meter

■ General ratings / Absolute maximum ratings

Type No.	Dimensional outline	Active area (mm)	Resistance length (mm)	Absolute maximum ratings		
				Reverse voltage VR Max. (V)	Operating temperature Topr (°C)	Storage temperature Tstg (°C)
S6407	①	1 × 1	1	20	-25 to +85	-40 to +100
S6515		1 × 1.2	1.2			
S4580-04	②	0.8 × 1.5	1.5			
S4580-06						
S4581-04	②	1 × 2	2			
S4581-06						
S3271-05	③	1 × 2.5	2.5			
S4582-04	②					
S4582-06	③	1 × 3	3			
S3272-05	③					
S4583-04	②	1 × 3	3			
S4583-06						
S3273-05	③	1 × 3.5	3.5			
S7879	④					
S8361	②	1 × 3.5	3.5			
S4584-04						
S4584-06	③	1 × 4.2	4.2			
S3274-05	⑤					
S7105-04	⑤	1 × 4.2	4.2			
S7105-06						
S7105-05	⑥	1 × 6	6			
S5629						
S5629-01						
S5629-02						

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

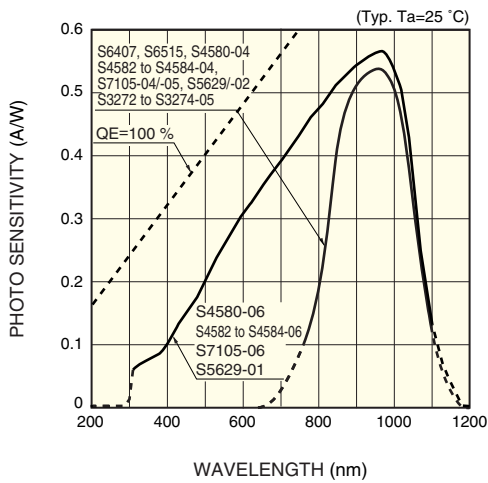
Type No.	Spectral response range λ (nm)	Peak sensitivity wavelength λ_p (nm)	Photo sensitivity S		Interelectrode resistance Rie Vb=0.1 V			Position detection error *1 VR=1 V spot light size = ϕ 300 μ m		Saturation photocurrent *2 Ist VR=1 V RL=1 k Ω	Dark current Id VR=1 V		Temp. coefficient of Id TCID (Times/°C)	Rise time tr *3 VR=1 V RL=1 k Ω		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)	(μ A)	Typ. (nA)	Max. (nA)		$\lambda=650$ nm (μ s)	$\lambda=890$ nm (μ s)	
S6407	760 to 1100	960	-	0.51	160	200	240	\pm 5	\pm 15	25	0.05	1	1.15	-	10	15
S6515					100	140	180			30						
S4580-04	760 to 1100	960	-	0.51	100	140	180	\pm 10	\pm 20	30	0.05	1	1.15	-	10	15
S4580-06	320 to 1100		0.35											3		
S4581-04	760 to 1060	920	-	0.51	100	140	180	\pm 10	\pm 20	30	0.05	1	1.15	-	10	15
S4581-06	320 to 1060		0.38											3		
S3271-05	760 to 1060		-											15		
S4582-04	760 to 1100	960	-	0.51	100	140	180	\pm 10	\pm 25	30	0.05	1	1.15	-	10	15
S4582-06	320 to 1100		0.33											3		
S3272-05	760 to 1100		-											15		
S4583-04	760 to 1100	960	-	0.51	100	140	180	\pm 10	\pm 30	30	0.05	1	1.15	-	10	15
S4583-06	320 to 1100		0.33											3		
S3273-05	760 to 1100		-		15											
S7879	440 to 1100		0.36		-	15										
S8361	400 to 1100	680	0.45	0.45	70	110	150	\pm 15	\pm 60	40				1	4	30
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											3		
S3274-05	760 to 1100		-											15		
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											2		
S7105-05	760 to 1100		-											10		
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											2		
S5629-02	760 to 1100		-		10											

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

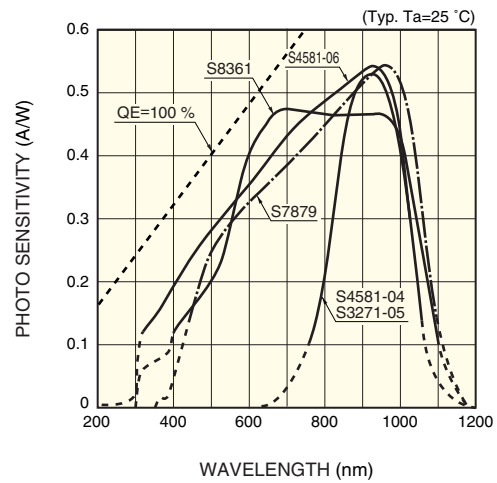
*2: This indicates the upper limit of the photocurrent linearity over the entire incident light quantity and is defined as the photocurrent at a point where the linearity deviates by 10 %.

*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

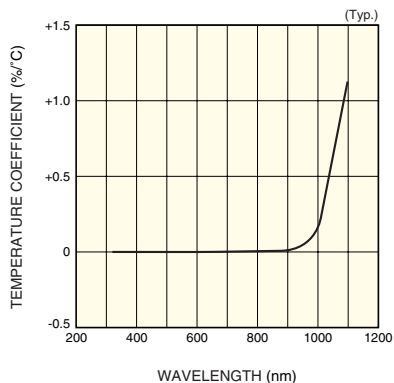


KPSDB0079EB



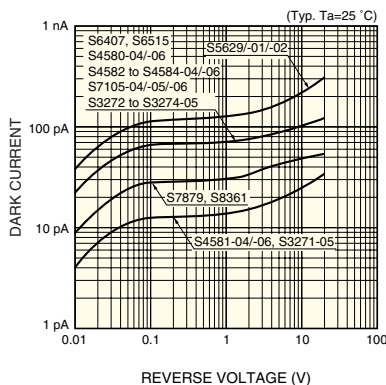
KPSDB0080EB

Photo sensitivity temperature characteristic (S4581-06)



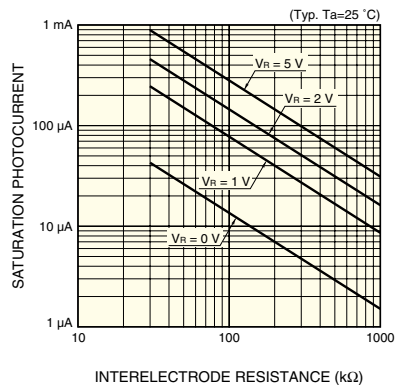
KPSDB0002EE

Dark current vs. reverse voltage



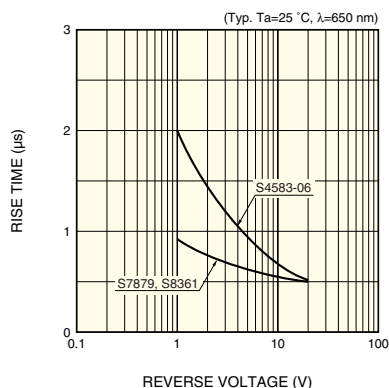
KPSDB0004EE

Saturation photocurrent vs. interelectrode resistance

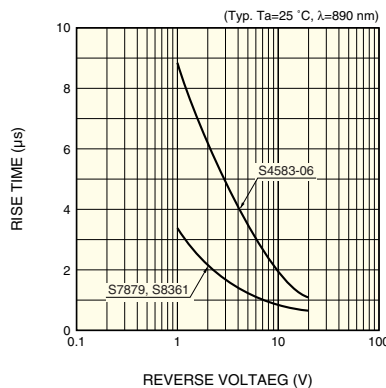


KPSDB0003EA

Rise time vs. reverse voltage

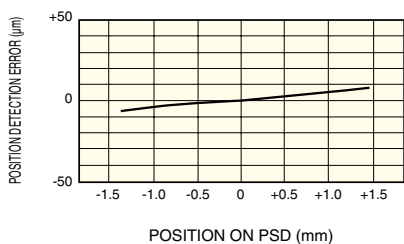
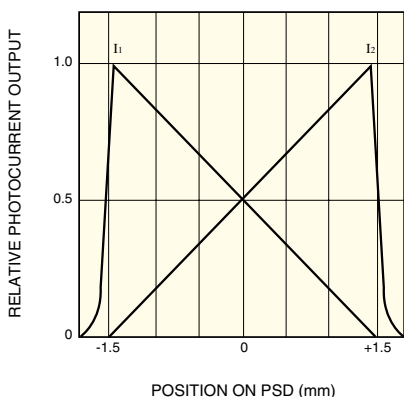


KPSDB00095EA



KPSDB00096EB

Position detection characteristic example (S4583-04, active area size: 1 × 3 mm)



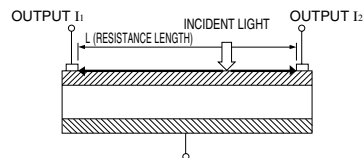
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Definition of position detection error

When the electrical center of a PSD is assumed to be the position of incident light where light current I_1 equals I_2 , position detection error at each incident position can be defined by the following equation.

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

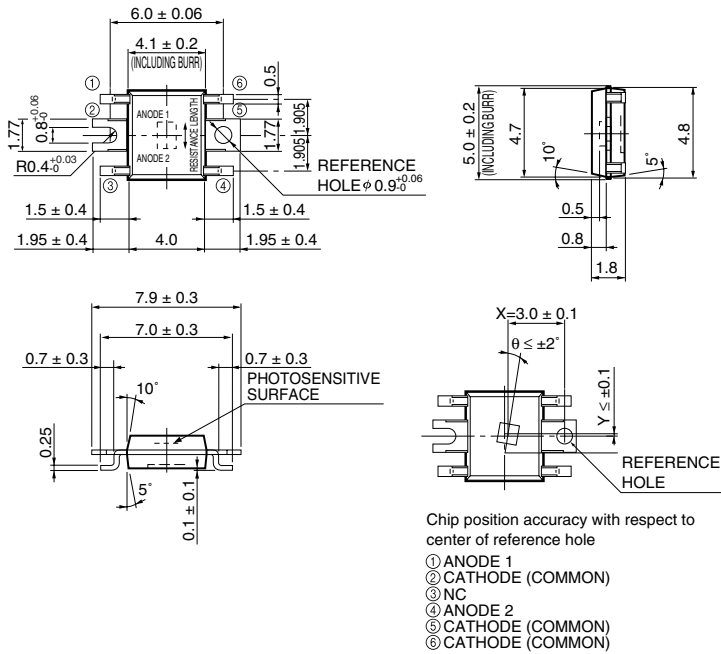
The electrical center is viewed as 0, I_1 as (+), and I_2 as (-).



KPSDC0001EA

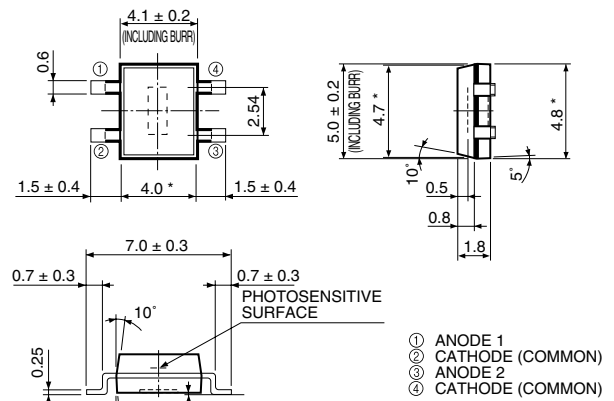
■ Dimensional outlines [unit: mm, tolerance unless otherwise noted: ± 0.1 , chip position accuracy (without ①) with respect to the package dimensions marked * X, $Y \leq \pm 0.2$, $\theta \leq \pm 2^\circ$]

① S6407, S6515 (Surface mounting type)



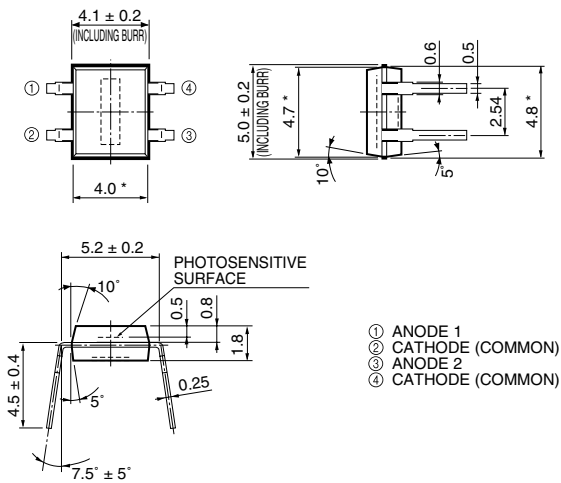
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② S4580 to S4584-04/-06 (Surface mounting type)



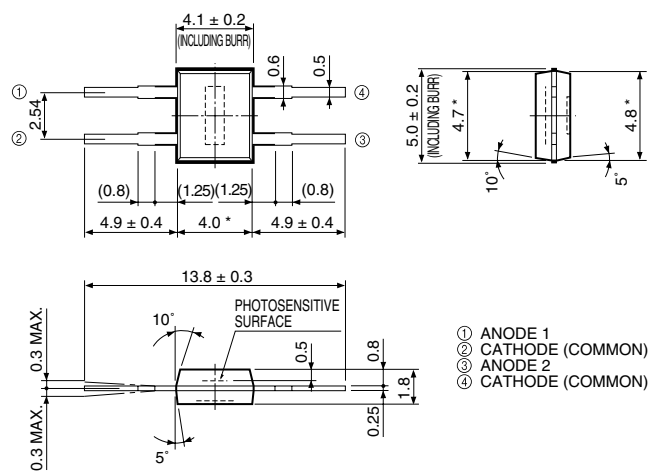
KPSDA0022EA

③ S3271 to S3274-05



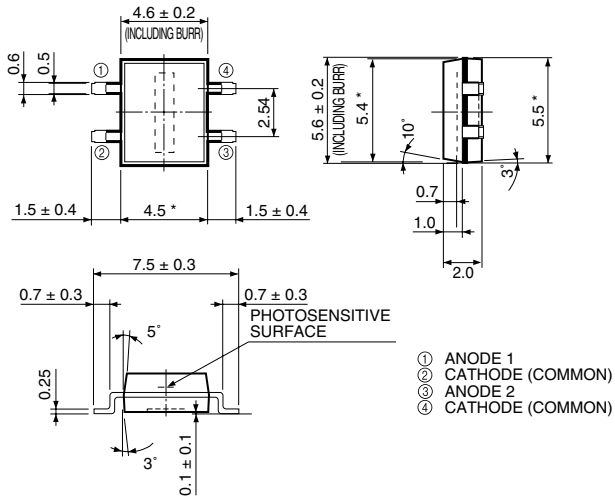
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④ S7879, S8361



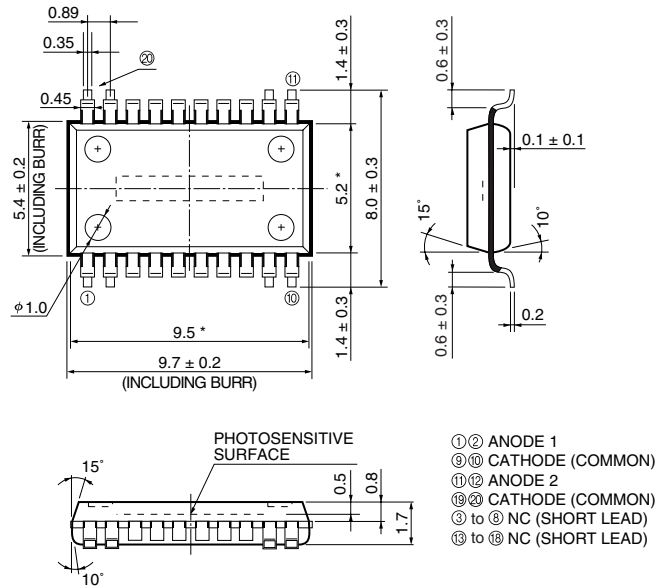
KPSDA0052EA

⑤ S7105-04/-05/-06 (Surface mounting type)



KPSDA0047EA

⑥ S5629-01/-02 (Surface mounting type)



KPSDA0023EA

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