



S8543

Long, narrow photosensitive area and surface mountable package

The S8543 is a one-dimensional PSD with a long, narrow photosensitive area sealed in a surface mountable chip carrier package. The photosensitive area of 0.7×24 mm delivers excellent position detection characteristics. Hamamatsu also provides the L5586 infrared LED compatible with the S8543.

Features

- Long, narrow photosensitive area: 0.7×24 mm
- Chip carrier package for surface mount ($t=1.36$ mm)
- Excellent position detection characteristics and resolution

Applications

- Position detection of optical pickup head
- Distance measurement
- Displacement measurement
- Position detection, etc.

Absolute maximum ratings ($T_a=25$ °C)

Parameter	Symbol	Value	Unit
Reverse voltage	V_R max	7	V
Operating temperature	T_{opr}	-10 to +75	°C
Storage temperature	T_{stg}	-20 to +80	°C

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.

Electrical and optical characteristics ($T_a=25$ °C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	320 to 1100	-	nm
Peak sensitivity wavelength	λ_p		-	960	-	nm
Photo sensitivity	S	$\lambda=\lambda_p$	-	0.58	-	A/W
Dark current	I_D	$V_R=5$ V	-	1	15	nA
Rise time	t_r	$R_L=1$ k Ω , $V_R=5$ V $\lambda=780$ nm, 10 to 90%	-	20	50	μ s
Terminal capacitance	C_t	$V_R=5$ V, $f=10$ kHz	-	65	130	pF
Interelectrode resistance	R_{ie}	$V_b=0.1$ V	100	140	180	k Ω
Position detection error	E	$\lambda=900$ nm, $V_R=5$ V $\phi 200$ μ m *1	-	± 50	± 250	μ m
Position resolution	ΔR	$I_o=1$ μ A, $B=1$ kHz *2	-	0.6	-	μ m
Saturation photocurrent*3	I_{st}	$V_R=5$ V	200	-	-	μ A

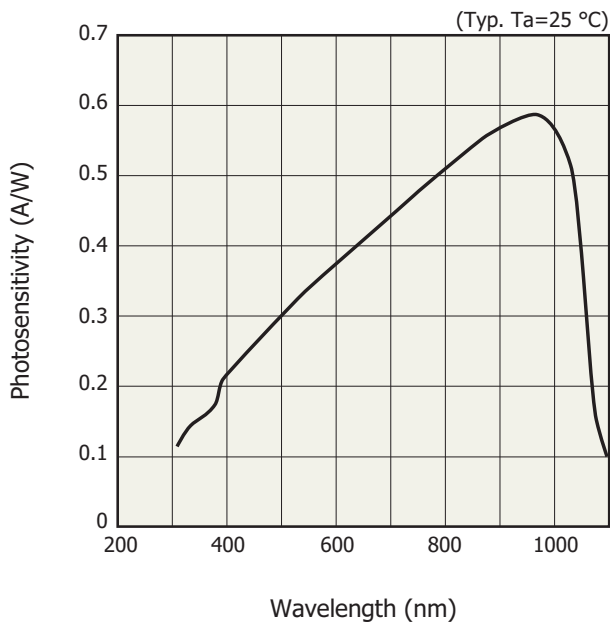
*1: Within $\pm 75\%$ from center to end of photosensitive area

*2: This is the minimum detectable light spot displacement. The detection limit is indicated by the distance on the photosensitive surface. The numerical value of the resolution of a position sensor using a PSD is proportional to both the length of the PSD and the noise of the measuring system (resolution deteriorates) and inversely proportional to the photocurrent (incident energy) of the PSD (resolution improves). The resolution value listed in this datasheet was calculated under the following conditions.

- Frequency bandwidth: 1 kHz
- Photocurrent: 1 μ A
- Equivalent input noise voltage of circuit: 1 μ V (1 kHz)
- Interelectrode resistance: Typical value (refer to the specification table)

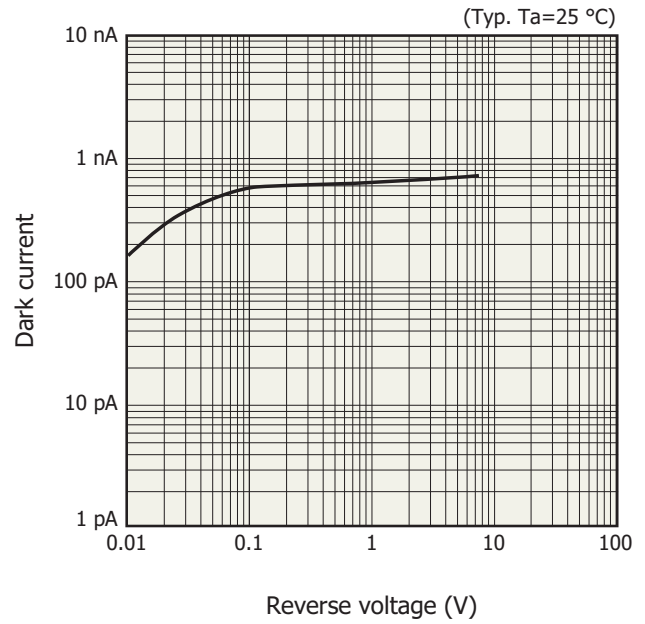
*3: This is the upper limit of photocurrent linearity. The upper limit is defined as a point where the photocurrent output deviates 10% from the linearity.

Spectral response



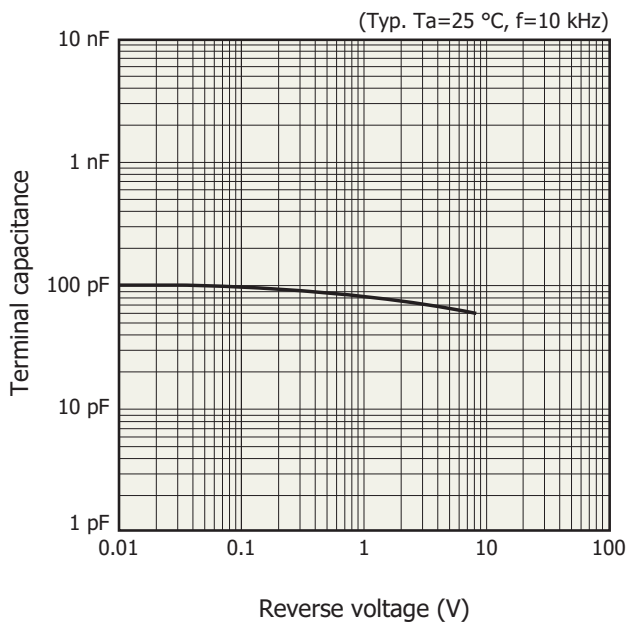
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Dark current vs. reverse voltage



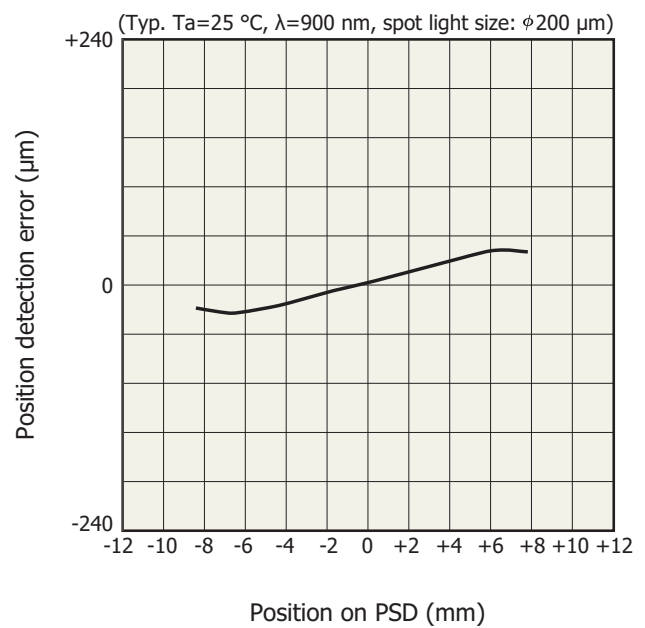
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Terminal capacitance vs. reverse voltage



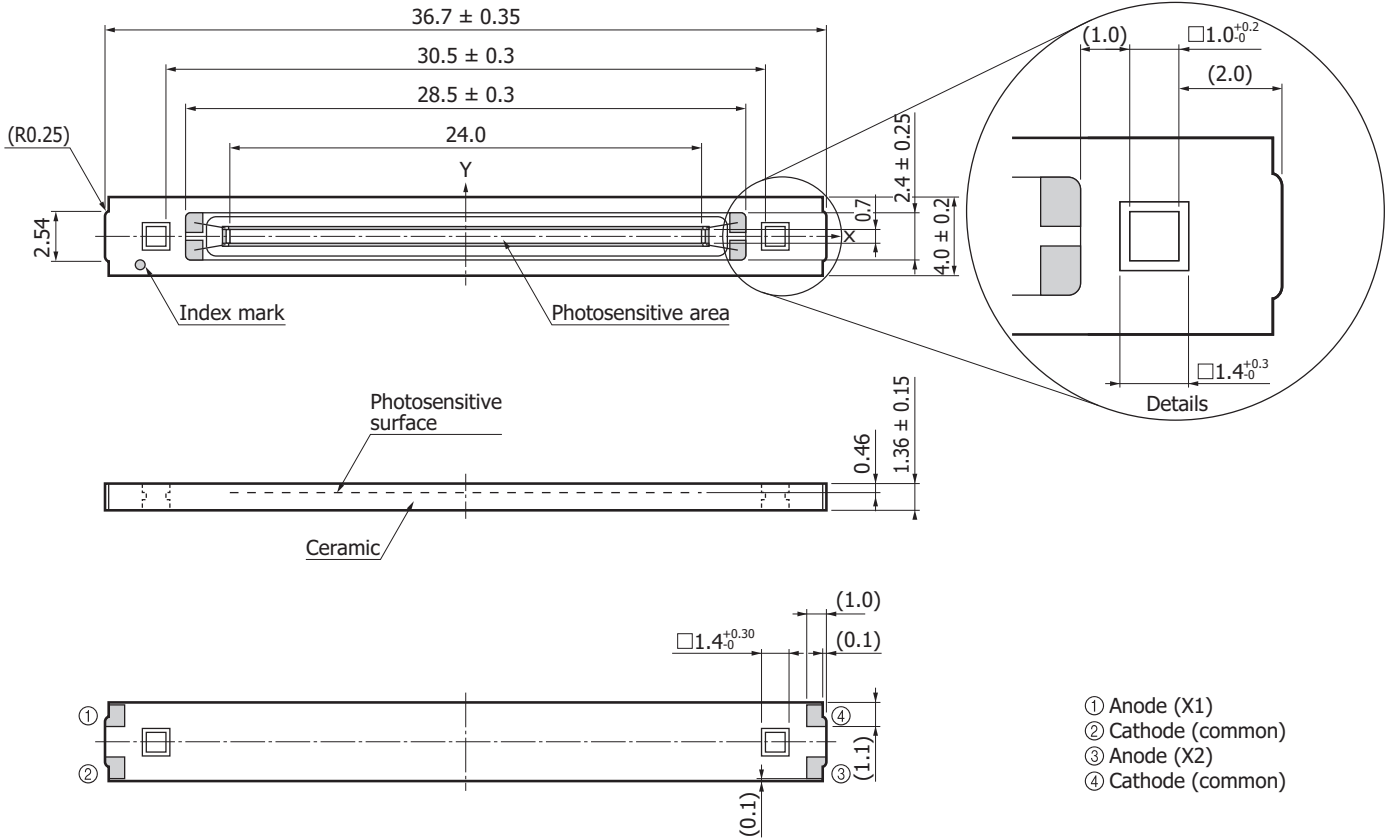
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Position detection error



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Dimensional outline (unit: mm)



KPSDA0058EB

Related information

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

Precautions

- Disclaimer
- Surface mount type products

Technical information

- PSD

Information described in this material is current as of October 2017.

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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