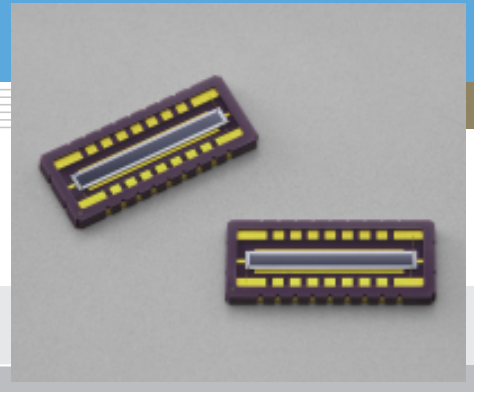


One-dimensional PSD

S8554

Long, narrow active area and surface mountable package



S8554 is a one-dimensional PSD (Position Sensitive Detector) with a long, narrow active area sealed in a surface mountable chip carrier package. S8554 delivers excellent position detection characteristic and resolution. Hamamatsu also provides L5586 infrared LED compatible with S8554.

Features

- Long, narrow active area: 1 × 12 mm
- Chip carrier package for surface mount (t=1.26 mm)
- Excellent position detection characteristic and resolution

Applications

- Distance measurement
- Displacement measurement
- Position detection, etc.

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Reverse voltage	VR Max.	20	V
Operating temperature	Topr	-10 to +60	°C
Storage temperature	Tstg	-20 to +80	°C

■ Electrical and optical characteristics (Ta=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	$\lambda = \lambda_p$	-	0.60	-	A/W
Dark current	Id	VR=5 V	-	0.2	20	nA
Rise time	tr	VR=5 V, RL=1 kΩ $\lambda = 830$ nm, 10 to 90 %	-	3.0	-	μs
Terminal capacitance	Ct	VR=5 V, f=10 kHz	-	80	-	pF
Interelectrode resistance	Rie	Vb=0.1 V	30	50	80	kΩ
Position detection error	E	VR=5 V, $\lambda = 900$ nm $\phi 200 \mu\text{m}$ *1	-	±60	±240	μm
Position resolution	ΔR	Io=1 μA, B=1 kHz *2	-	0.3	-	μm
Saturation photocurrent *3	Ist	VR=5 V	500	-	-	μA

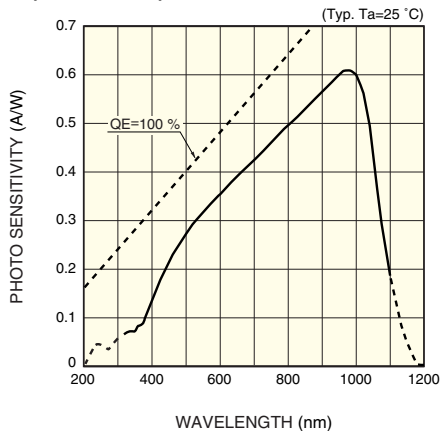
*1: Within ±75 % from center to end of active area

*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 data sheet was calculated under the following conditions.

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

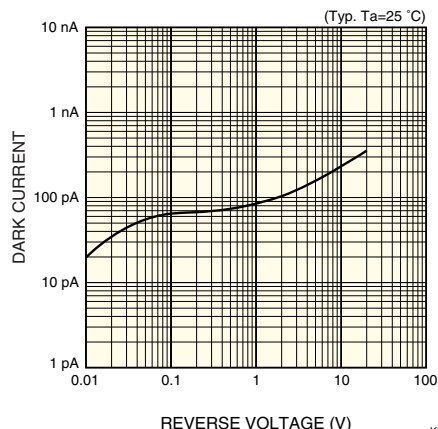
*3: This is the upper limit of photocurrent linearity. The upper limit is defined as a point where the photocurrent output deviates 10 % from the linearity.

■ Spectral response



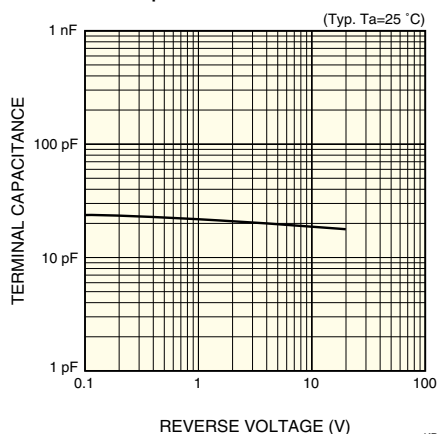
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■ Dark current vs. reverse voltage



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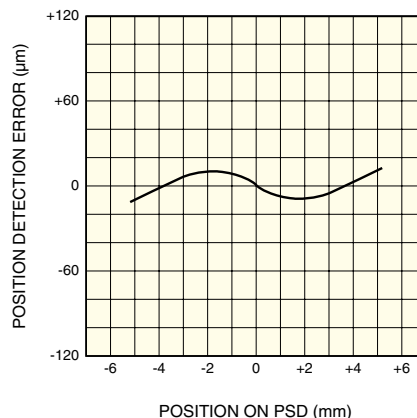
■ Terminal capacitance vs. reverse voltage



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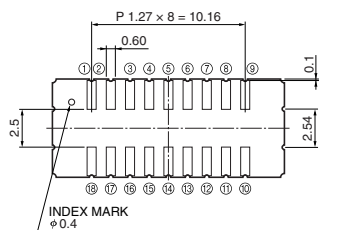
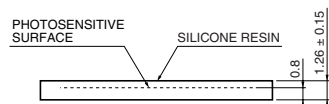
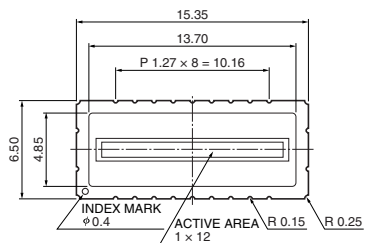
■ Position detection characteristic example

(Ta=25 °C, λ=830 nm, spot light size: φ0.2 mm)



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■ Dimensional outline (unit: mm)



- ① ANODE X1
 - ② to ⑧ NC
 - ⑨ CATHODE (COMMON)
 - ⑩ ANODE X2
 - ⑪ to ⑫ NC
- Tolerance unless otherwise noted: ±0.25 mm
Chip position accuracy with respect to the package center X, Y ≤ ±0.3
Burr shall protrude no more than 0.3 mm on any side of package.

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