One-dimensional PSD
S8543

Long, narrow active area and surface mountable package

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

Features

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

Applications

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

■ Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Reverse voltage	V_R Max.	7	V
Operating temperature	Topr	-10 to +75	°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	λp		-	960	-	nm
Photo sensitivity	S	λ=λp	-	0.58	-	A/W
Dark current	I_D	V_R=5 V	-	1	15	nA
Rise time	tr	R_L=1 kΩ, V_R=5 V λ=780 nm, 10 to 90 %	-	20	50	μs
Terminal capacitance	Ct	V_R=5 V, f=10 kHz	-	65	130	pF
Interelectrode resistance	Rie	Vb=0.1 V	100	140	180	kΩ
Position detection error	E	λ=900 nm, V_R=5 V ϕ200 μm *1	-	±50	±250	μm
Position resolution	ΔR	Io=1 μA, B=1 kHz *2	-	0.6	-	μm
Saturation photocurrent *3	Ist	V_R=5 V	200	-	-	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.

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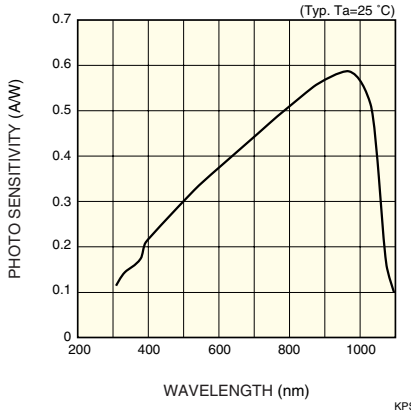
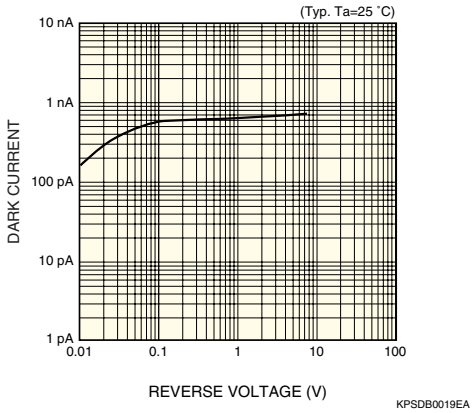
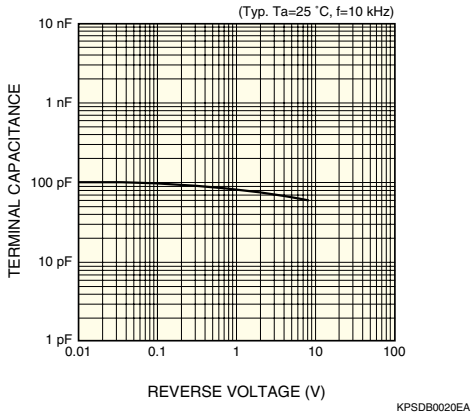
■ Spectral response



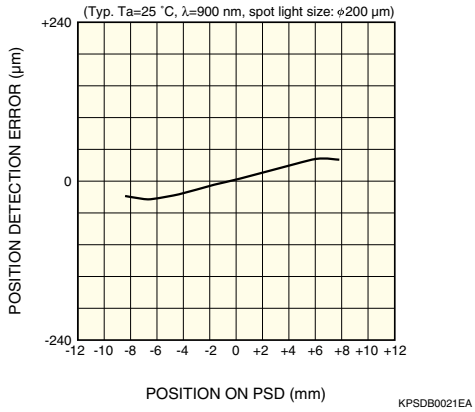
■ Dark current vs. reverse voltage



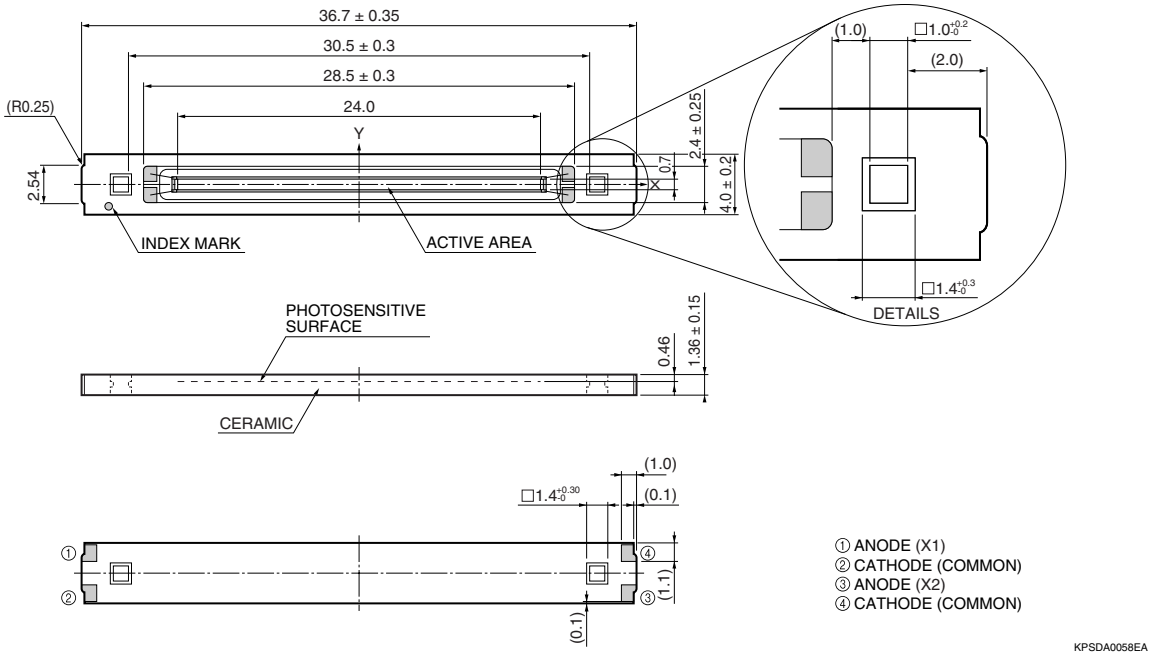
■ Terminal capacitance vs. reverse voltage



■ Position detection error



■ Dimensional outline (unit: mm)



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