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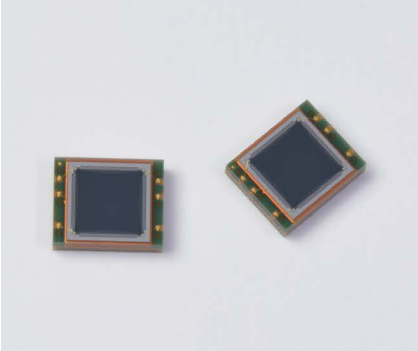
NEW

Two-dimensional PSD



S15534

Surface mount type, high-accuracy position sensitive detector

The S15534 is a surface mount type two-dimensional PSD with excellent position detection characteristics. It is smaller than the conventional S5990-01.

Features

- **COB type**
- **Excellent position detectability**
- **Small package: 7.21 × 5.96 × 1.5^{t} mm**
- **Compatible with lead-free solder reflow**

Applications

- **Light spot detection**
- **Pointing device**
- **Various types of position detection**

Options (sold separately)

- **Signal processing circuit for 2-D PSD** **C4674-01**

Structure

Parameter	Symbol	Specification	Unit
Photosensitive area	A	4 × 4	mm
Package	-	Glass epoxy	-
Window material	-	Silicone resin	-

Absolute maximum ratings (Ta=25 °C)

Parameter	Symbol	Value	Unit
Reverse voltage	V_R max	20	V
Operating temperature*1	Topr	-20 to +60	°C
Storage temperature*1	Tstg	-20 to +80	°C
Soldering temperature	Tsol	260 (3 times)*2	°C

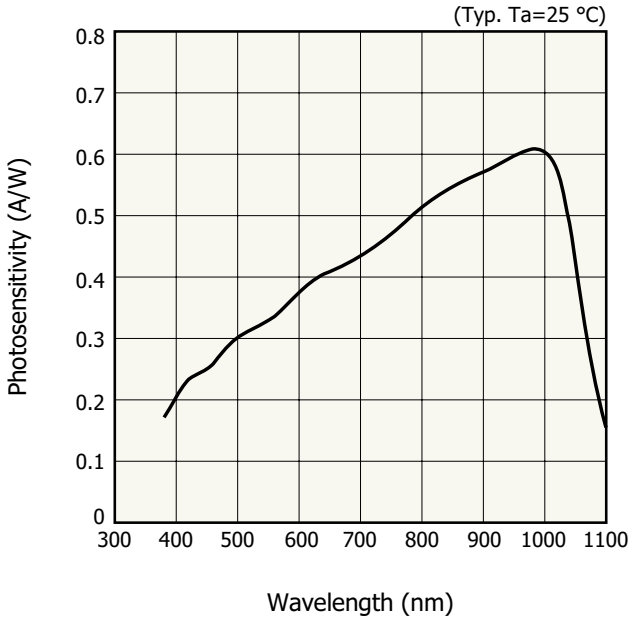
*1: No dew condensation. When there is a temperature difference between a product and the surrounding area in high humidity environments, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
*2: Reflow soldering, JEDEC J-STD-020 MSL 3, see P.5
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 (Ta=25 °C)

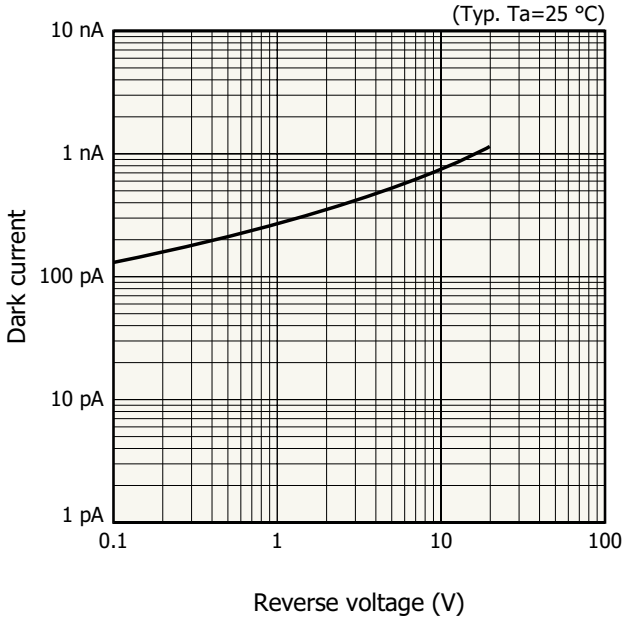
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ		-	380 to 1100	-	nm
Peak sensitivity wavelength	λp		-	980	-	nm
Photosensitivity	S	λ=λp	-	0.6	-	A/W
Interelectrode resistance	Rie	Vb=0.1 V	5	7	15	kΩ
Position detection error	E	λ=900 nm, VR=5 V light spot: ϕ0.2 mm*3	-	±70	±150	μm
Saturation photocurrent	Ist	λ=900 nm, VR=5 V RL=1 kΩ	-	500	-	μA
Dark current	ID	VR=5 V	-	0.5	10	nA
Rise time	tr	VR=5 V, RL=1 kΩ λ=900 nm	-	1	-	μs
Terminal capacitance	Ct	VR=5 V, f=10 kHz	-	70	-	pF
Position resolution	ΔR	Io=1 μA, B=1 kHz*3	-	0.7	-	μm

*3: Specified within a circle that is 80% of the photosensitive area. Recommended light spot size: ϕ0.2 mm or more

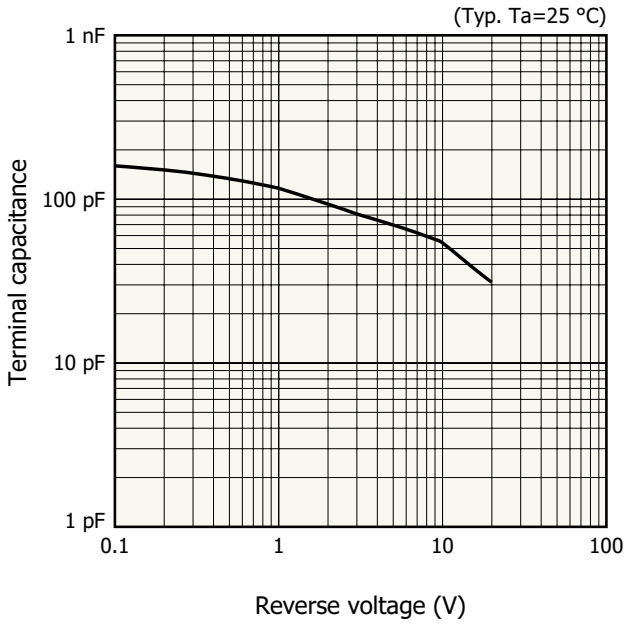
Spectral response



Dark current vs. reverse voltage

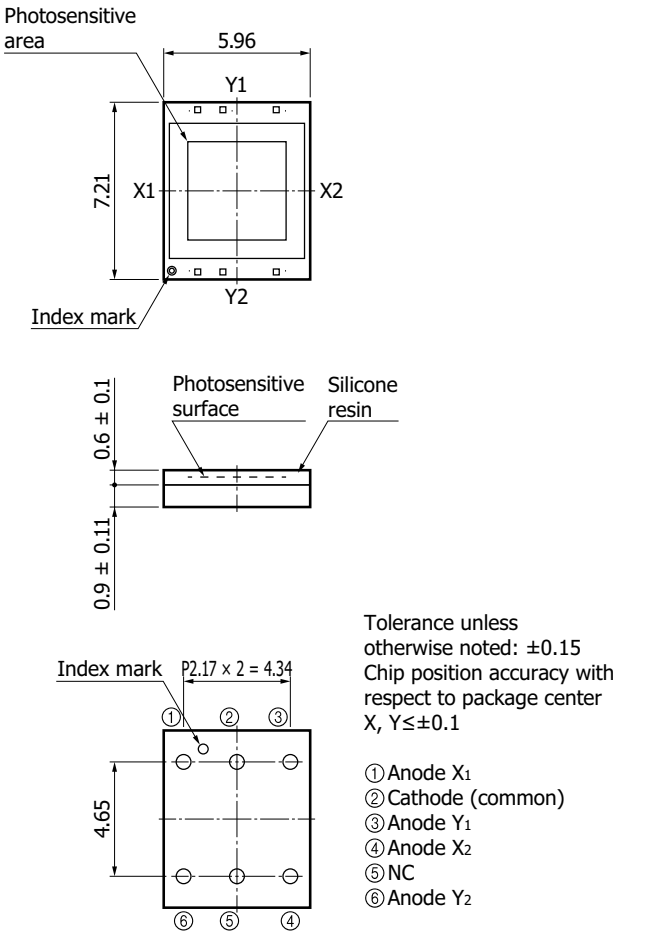


Terminal capacitance vs. reverse voltage



KPSDB0130EA

Dimensional outline (unit: mm)



KPSDA0068EA

Conversion formula of spot light position on the PSD

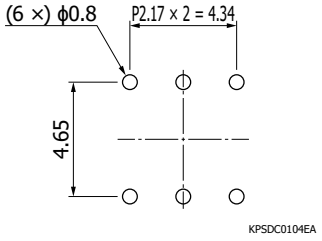
Output signals (photocurrent) I_{X1}, I_{X2}, I_{Y1}, I_{Y2} obtained from electrodes and the light spot position x, y can be found by the following formula.

$$\frac{(I_{X2} + I_{Y1}) - (I_{X1} + I_{Y2})}{I_{X1} + I_{X2} + I_{Y1} + I_{Y2}} = \frac{2x}{L_X}$$

$$\frac{(I_{X2} + I_{Y2}) - (I_{X1} + I_{Y1})}{I_{X1} + I_{X2} + I_{Y1} + I_{Y2}} = \frac{2y}{L_Y}$$

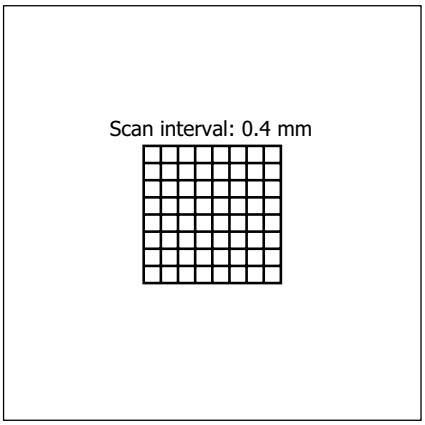
I_{X1} : Output signal from electrode X1
I_{X2} : Output signal from electrode X2
I_{Y1} : Output signal from electrode Y1
I_{Y2} : Output signal from electrode Y2
x, y : Position coordinate of light spot
L_X, L_Y: Resistance length (4.5 mm)

Recommended land pattern (unit: mm)



KPSDC0104EA

Example of position detectability (Ta=25 °C, λ=900 nm, light spot size: ϕ0.2 mm)



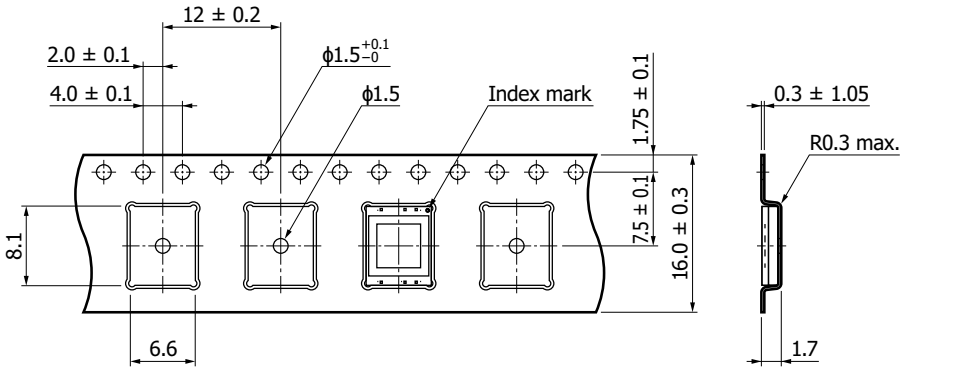
KPSDC0064EA

Standard packing specifications

■ Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
ϕ330 mm	ϕ100 mm	16 mm	PS	Conductive

■ Embossed tape (unit: mm, material: PS, conductive)

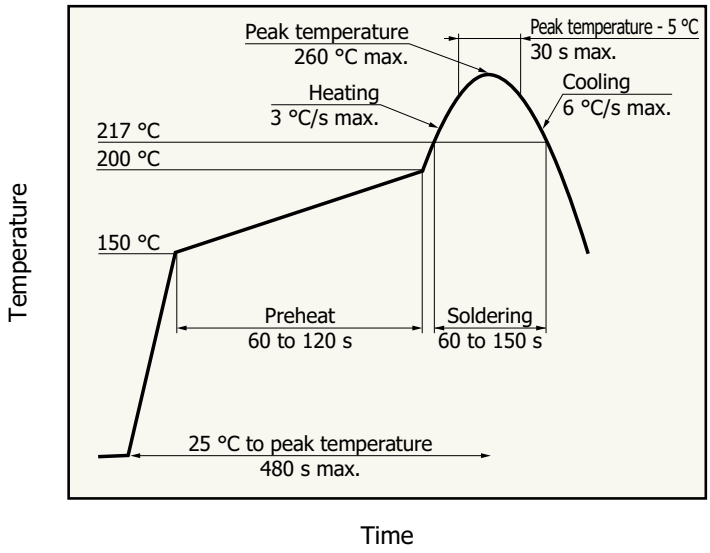


KPSDC0105EA

■ Packing quantity
500 pcs/reel

■ Packing state
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

Recommended reflow soldering conditions



KSPDB0419EA

- After unpacking, store in an environment at a temperature of 5 to 30 °C and a humidity 60% or less, and perform reflow soldering within 168 hours.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. When you set reflow soldering conditions, check that problems do not occur in the product by testing out the conditions in advance.

Baking

If more than 12 months have passed in the unopened state, or storage conditions are exceeded after opening the package, baking is required to remove moisture before reflow soldering. For the baking, refer to "Precautions / Surface mount type products" in the related information.

■ Recommended baking conditions

Temperature: 120 °C, 3 hours, up to twice
Note: Before setting the baking conditions, perform experiments to confirm that no problems occur with the product.

Related information

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

■ Precautions
- Disclaimer
- Precautions / Surface mount type products

■ Catalogs
- Technical note / PSD

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HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Chuo-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81)53-434-3311, Fax: (81)53-434-5184
U.S.A.: HAMAMATSU CORPORATION: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218
Germany: HAMAMATSU PHOTONICS DEUTSCHLAND GMBH: Arzbergerstr. 10, 82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de
France: HAMAMATSU PHOTONICS FRANCE S.A.R.L.: 19 Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: HAMAMATSU PHOTONICS UK LIMITED: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire, AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: HAMAMATSU PHOTONICS NORDEN AB: Torshamnsgatan 35, 16440 Kista, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01 E-mail: info@hamamatsu.se
Italy: HAMAMATSU PHOTONICS ITALIA S.R.L.: Strada della Moia, 1 int. 6 20044 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it
China: HAMAMATSU PHOTONICS (CHINA) CO., LTD.: 1201, Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R. China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: HAMAMATSU PHOTONICS TAIWAN CO., LTD.: 13F-1, No.101, Section 2, Gongdao 5th Road, East Dist., Hsinchu City, 300046, Taiwan(R.O.C) Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw