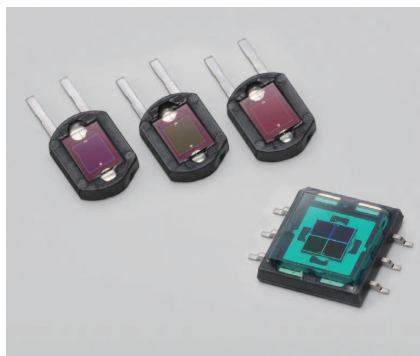


# Si photodiodes



S6428-01

S6429-01

S6430-01

S7505-01

## RGB color sensor

The S6428-01, S6429-01 and S6430-01 are color sensors designed to respectively detect monochromatic colors of blue ( $\lambda_p=460$  nm), green ( $\lambda_p=540$  nm) and red ( $\lambda_p=660$  nm).

The S7505-01 uses a 3-channel (RGB) photodiode having blue, green and red sensitivities, and is molded into a surface mount type package.

### Features

S6428-01, S6429-01, S6430-01

- Plastic package (6 × 8 mm)
- Spectral response range
  - S6428-01: 400 to 540 nm ( $\lambda_p=460$  nm)
  - S6429-01: 480 to 600 nm ( $\lambda_p=540$  nm)
  - S6430-01: 590 to 720 nm ( $\lambda_p=660$  nm)
- Insensitive to near IR range
- High sensitivity
  - S6428-01: 0.22 A/W Typ. ( $\lambda=\lambda_p$ )
  - S6429-01: 0.27 A/W Typ. ( $\lambda=\lambda_p$ )
  - S6430-01: 0.45 A/W Typ. ( $\lambda=\lambda_p$ )
- Low dark current

S7505-01

- 3 ch (RGB) Si photodiode
- Surface mount type plastic package (9 × 9.6 mm)
- High sensitivity

### Applications

- White balance adjustment
- Color identification
- Projector and TV brightness level detection
- Color control
- Light source color temperature detection

### Structure / Absolute maximum ratings

Type no.	Photosensitive area size (mm)	Effective photosensitive area (mm <sup>2</sup> )	Absolute maximum ratings		
			Reverse voltage V <sub>R</sub> max (V)	Operating temperature T <sub>opr</sub> (°C)	Storage temperature T <sub>stg</sub> (°C)
S6428-01	2.4 × 2.8	6.7	10	-10 to +60	-20 to +70
S6429-01					
S6430-01					
S7505-01	Green, Red: 1.5 × 1.5 Blue : 1.5 × 1.5 (2 elements)	Green, Red: 2.25 Blue : 4.5			

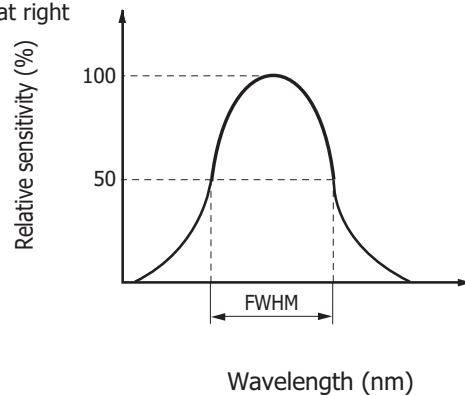
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

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

Type no.	Spectral response range $\lambda$ (nm)	Peak sensitivity wavelength $\lambda_p$ (nm)	Photo-sensitivity $S$ $\lambda=\lambda_p$ (A/W)	Dark current $I_D$ $V_R=1\text{ V}$		Temp. coefficient of $I_D$ (times/°C)	Rise time $t_r$ $V_R=0\text{ V}$ $R_L=1\text{ k}\Omega$ 10 to 90 % ( $\mu\text{s}$ )	Terminal capacitance $C_t$ $V_R=0\text{ V}$ $f=10\text{ kHz}$		Spectral response half width FWHM *2 (nm)
				Typ. (pA)	Max. (pA)			Typ. (pF)	Max. (pF)	
S6428-01	400 to 540	460	0.22	5	20	1.12	0.5	200	400	90
S6429-01	480 to 600	540	0.27							70
S6430-01	590 to 720	660	0.45							90
S7505-01	Blue	400 to 540	0.18	10 *1	200 *1	1.12	0.5	150	300	90
	Green	480 to 600	0.23							60
	Red	590 to 720	0.16							70

\*1: All elements

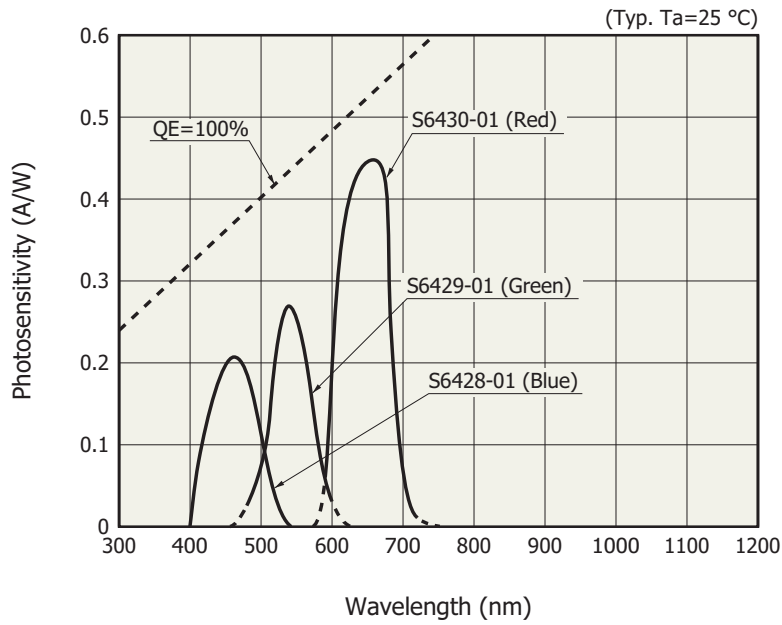
\*2: Defined as shown in the figure at right



KSPDC0031EA

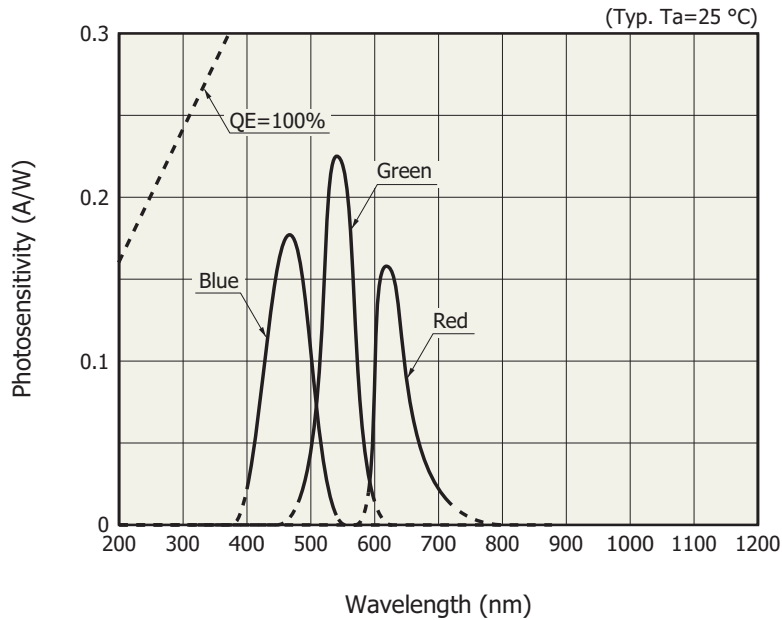
Spectral response

S6428-01, S6429-01, S6430-01



KKSPD0141EC

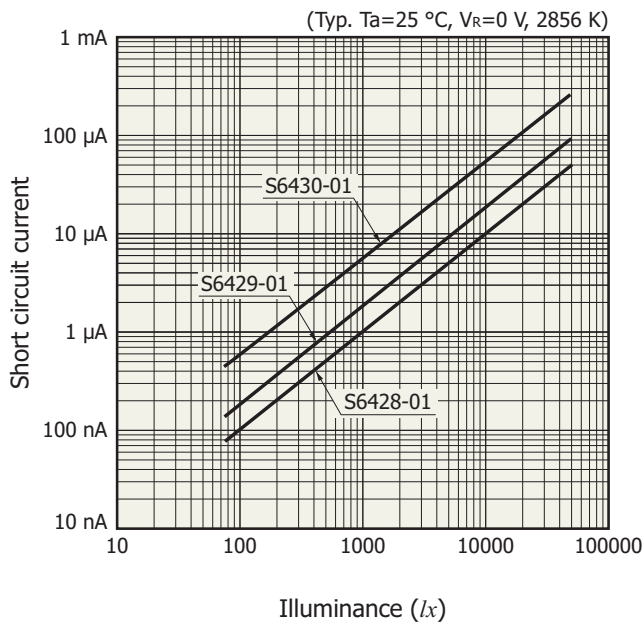
S7505-01



KMPD0217EA

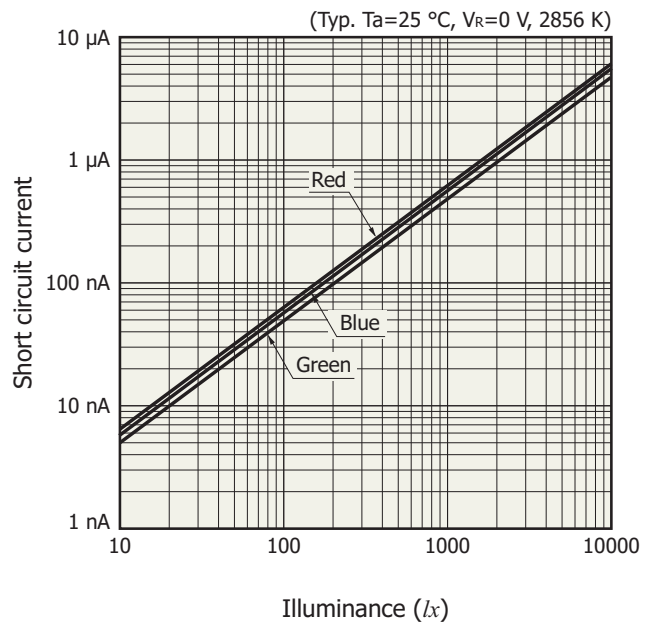
**Linearity**

S6428-01, S6429-01, S6430-01



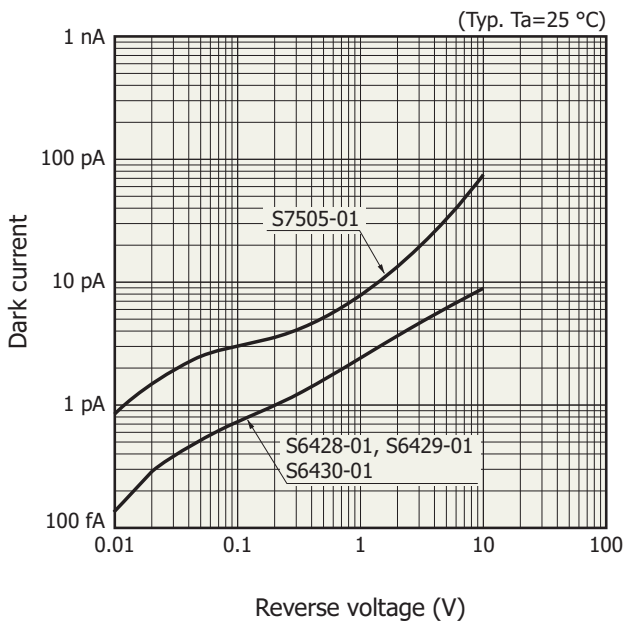
KSPDB0324EA

S7505-01



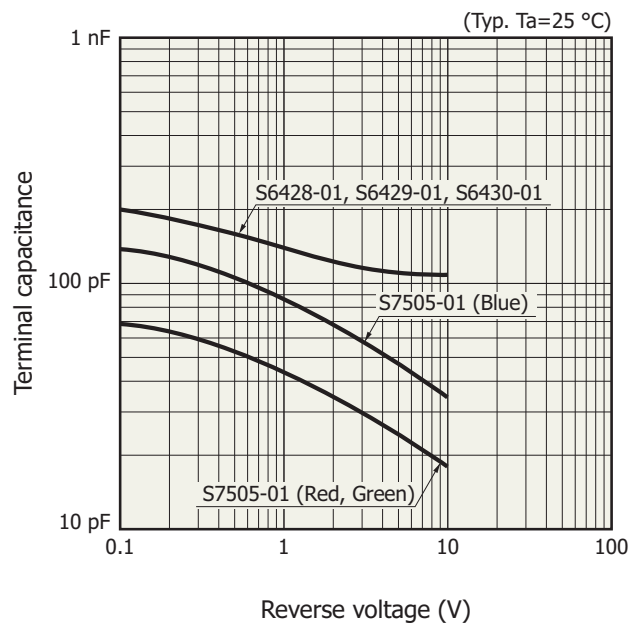
KSPDB0325EA

**Dark current vs. reverse voltage**



KSPDB0142EC

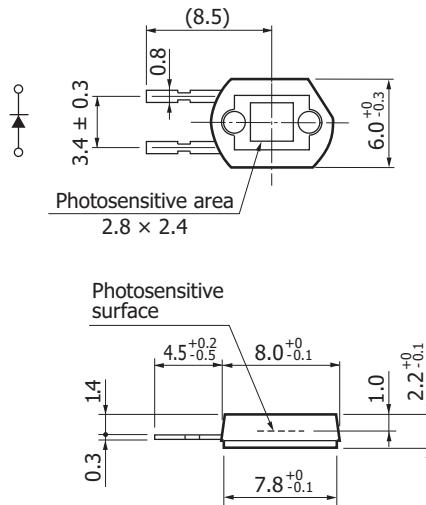
**Terminal capacitance vs. reverse voltage**



KSPDB0143EC

Dimensional outlines (unit: mm)

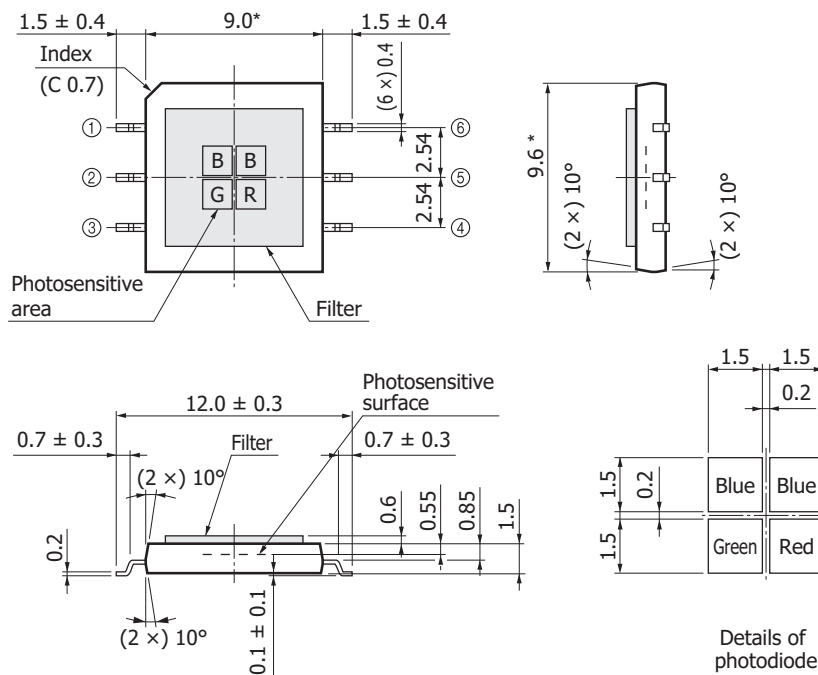
S6428-01, S6429-01, S6430-01



Tolerance unless otherwise noted:  $\pm 0.15$   
 Lead surface finish: Palladium  
 Standard packing: tray (100 pcs/tray)

KSPDA0056EA

S7505-01



- ① Anode (Blue)
- ② Cathode common
- ③ Anode (Green)
- ④ Anode (Red)
- ⑤ Cathode common
- ⑥ NC

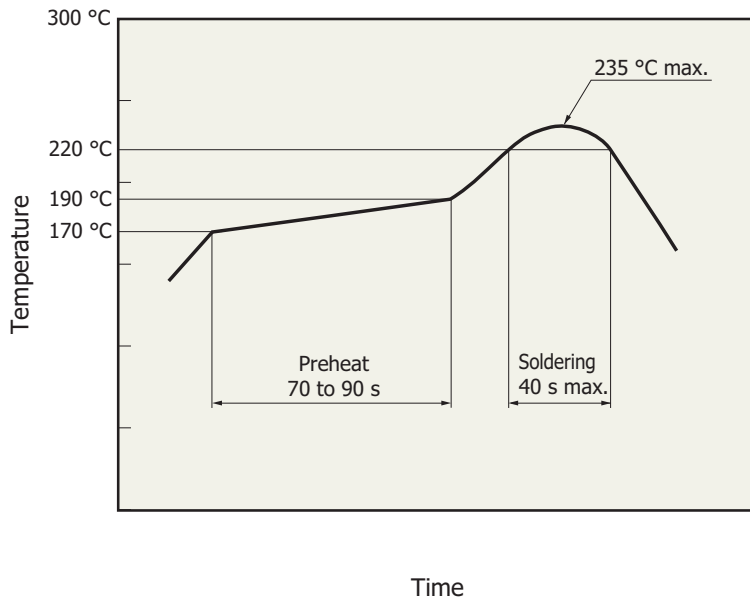
Tolerance unless otherwise noted:  $\pm 0.1$   
 Chip position accuracy with respect to the package dimensions marked \*  
 $X, Y \leq \pm 0.2$   
 $\theta \leq \pm 2^\circ$   
 Lead surface finish: gold plating  
 Standard packing: stick (50 pcs/stick)

KMPDA0073ED

Note: If excessive vibration is continuously applied to the glass filter, there is a risk that the filter may come off, so secure the glass filter with a holder.

### Measured example of temperature profile with our hot-air reflow oven for product testing

The S7505-01 supports lead-free soldering. After unpacking, store it in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 24 hours.



KSPD0317EA

### Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

#### Precautions

- Disclaimer
- Metal, Ceramic, Plastic products
- Surface mount type products

Information described in this material is current as of June, 2015.

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.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

# HAMAMATSU

[www.hamamatsu.com](http://www.hamamatsu.com)

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-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, N.J. 08807, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8

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

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39) 02-93581733, Fax: (39) 02-93581741

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866