

Si photodiode

S9032-02

RGB color sensor

The S9032-02 is a color sensor molded into a plastic package having a 3-channel (RGB) photodiode sensitive to the blue ($\lambda_p=460$ nm), green ($\lambda_p=540$ nm) and red ($\lambda_p=620$ nm) regions of the spectrum. The S9032-02 has a 3-segment (RGB) circular active area of $\phi 2$ mm.

Features

- 3-channel (RGB) Si photodiode
- Surface-mount small plastic package
- Spectral response range close to the human eye sensitivity
- No sensitivity in the near IR region
- Active area: 3-segment (RGB) circular active area of $\phi 2$ mm

Applications

- Color adjustment for LED back light system for LCD
- Color adjustment for LCD projector
- Color tester
- Color detection

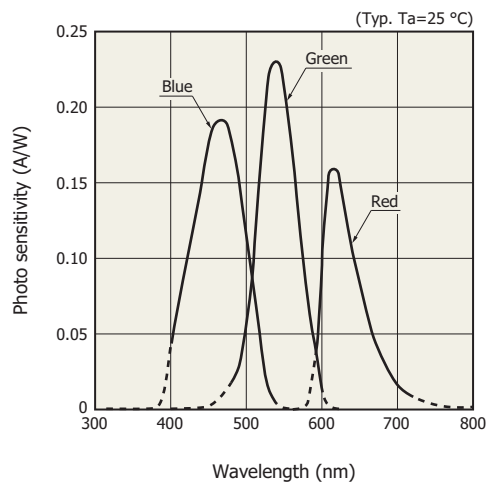
Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	V_R Max.	10	V
Operating temperature	T_{opr}	-25 to +85	°C
Storage temperature	T_{stg}	-40 to +85	°C

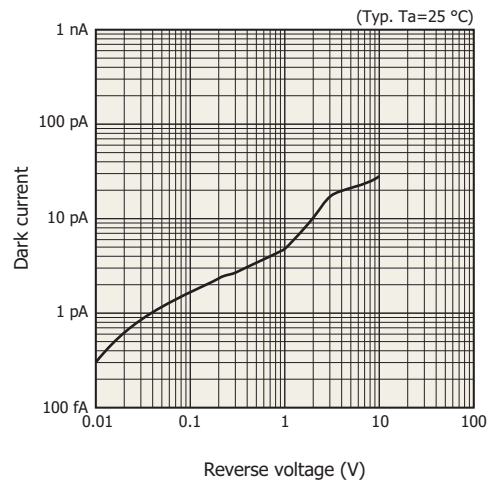
Electrical and optical characteristics ($T_a = 25$ °C, per element)

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
Spectral response range	λ	Blue		-	400 to 540	-	nm
		Green		-	480 to 600	-	
		Red		-	590 to 720	-	
Peak sensitivity wavelength	λ_p	Blue		-	460	-	nm
		Green		-	540	-	
		Red		-	620	-	
Photo sensitivity	S	$\lambda=\lambda_p$	Blue	0.13	0.18	-	A/W
			Green	0.18	0.23	-	
			Red	0.11	0.16	-	
Dark current	I_D	$V_R=1$ V All elements		-	5	100	pA
Temperature coefficient of I_D	T_{CID}			-	1.12	-	times/°C
Rise time	t_r	$V_R=0$ V, $R_L=1$ k Ω 10 to 90 %		-	0.2	1.0	μ s
Terminal capacitance	C_t	$V_R=0$ V $f=10$ kHz		-	40	80	pF

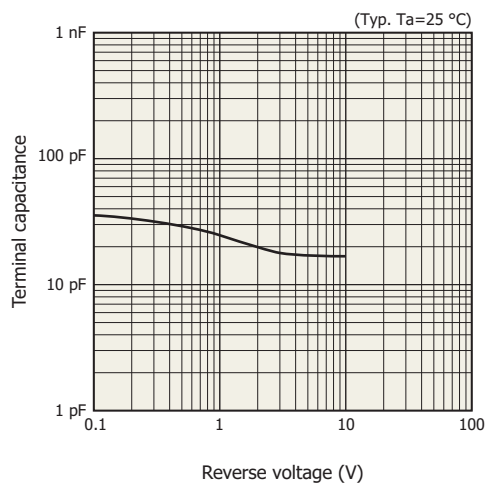
Spectral response



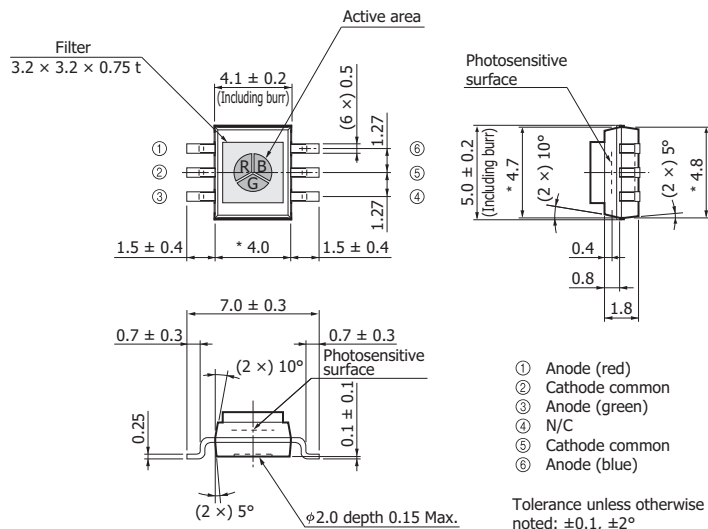
Dark current vs. reverse voltage



Terminal capacitance vs. reverse voltage



Dimensional outline (unit: mm)

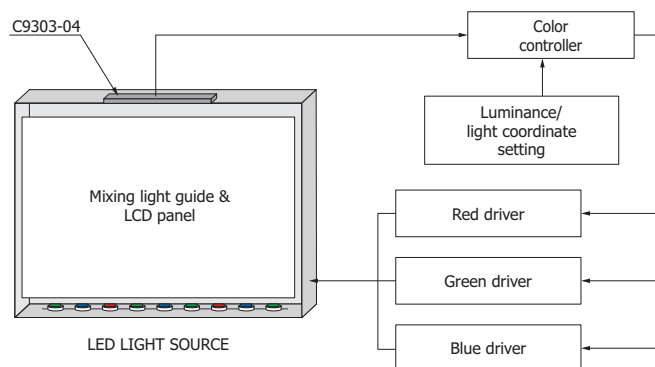


KSPDA0162EA

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.

Application example

Optical feedback of backlight for TFT-LCD using a color sensor module C9303-04 (integrated with the S9032-02)



LED: Made by Lumileds (LUXEON), <http://www.lumileds.com/>

KACCC0289EA

Line-up of RGB color sensors

Type No.		Spectral response range (nm)	Peak sensitivity wavelength (nm)	Photo sensitivity $\lambda = \lambda_p$ (A/W)	Dark current $V_R = 1\text{ V}$ All elements total Max. (pA)	Active area size (mm)	Package
S7505-01	B	400 to 540	460	0.18	200	$1.5 \times 1.5 (\times 2)$	Surface mount type plastic
	G	480 to 600	540	0.23		1.5×1.5	
	R	590 to 720	620	0.16		1.5×1.5	
S9032-02	B	400 to 540	460	0.18	100	$\phi 2/3$ elements	Surface mount type plastic
	G	480 to 600	540	0.23			
	R	590 to 720	620	0.16			
S9702	B	400 to 540	460	0.18	50	$1 \times 1/3$ elements	Surface mount type, small plastic
	G	480 to 600	540	0.23			
	R	590 to 720	620	0.16			
S10170	B	400 to 540 800 to 1000	See the datasheet. (spectral response)	0.21 ^{*1}	50	$1 \times 1/3$ elements	Surface mount type, small and thin plastic
	G	480 to 600 760 to 1000		0.28 ^{*2}			
	R	590 to 1000		0.45 ^{*3}			

*1: $\lambda = 460\text{ nm}$ *2: $\lambda = 540\text{ nm}$ *3: $\lambda = 640\text{ nm}$

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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, P.O.Box 6910, Bridgewater, N.J. 08807-0910, 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) 08152-3750, Fax: (49) 08152-2658

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: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741