HAMAMATSU
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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 (λp=460 nm), green (λp=540 nm) and red (λp=620 nm) regions of the spectrum. The S9032-02 has a 3-segment (RGB) circular photosensitive area of ϕ2 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**
- **Photosensitive area: 3-segment (RGB) circular photosensitive area of ϕ2 mm**

Applications

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

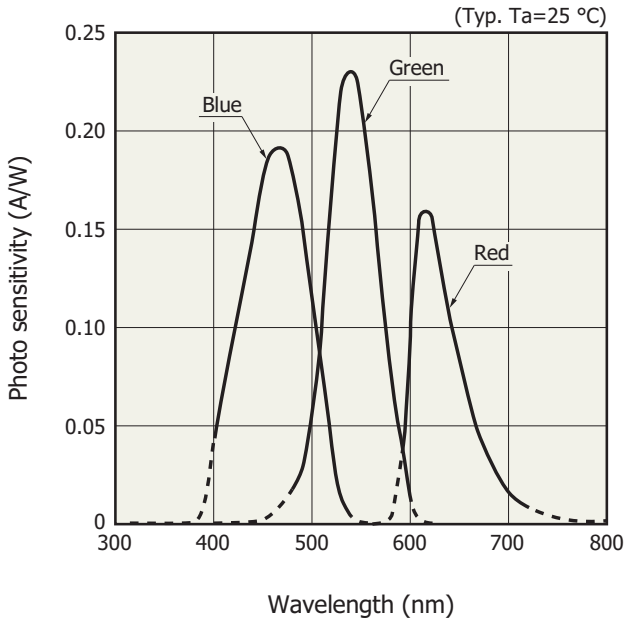
Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	V_R Max.	10	V
Operating temperature	Topr	-25 to +85	°C
Storage temperature	Tstg	-40 to +85	°C

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

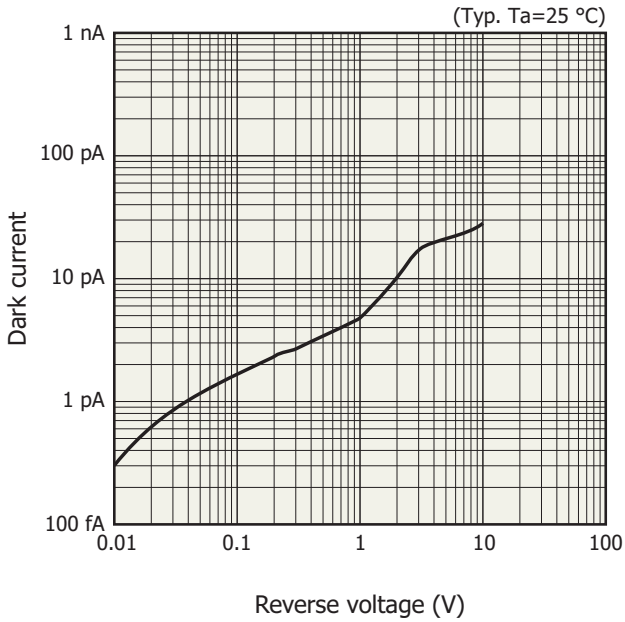
Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
Spectral response range	λ	Blue		-	400 to 540	-	nm
		Green		-	480 to 600	-	
		Red		-	590 to 720	-	
Peak sensitivity wavelength	λp	Blue		-	460	-	nm
		Green		-	540	-	
		Red		-	620	-	
Photo sensitivity	S	λ=λp	Blue	0.13	0.18	-	A/W
			Green	0.18	0.23	-	
			Red	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	tr	V_R=0 V, R_L=1 kΩ 10 to 90%		-	0.2	1.0	μs
Terminal capacitance	Ct	V_R=0 V f=10 kHz		-	40	80	pF

Spectral response



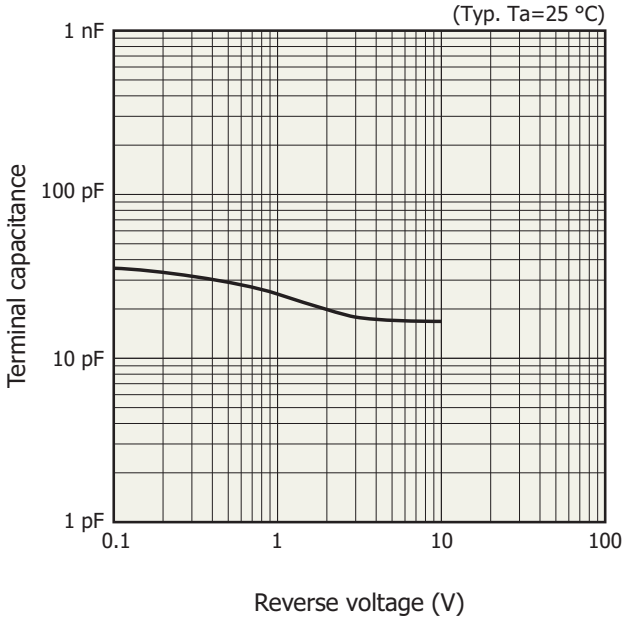
KSPDB0246EA

Dark current vs. reverse voltage



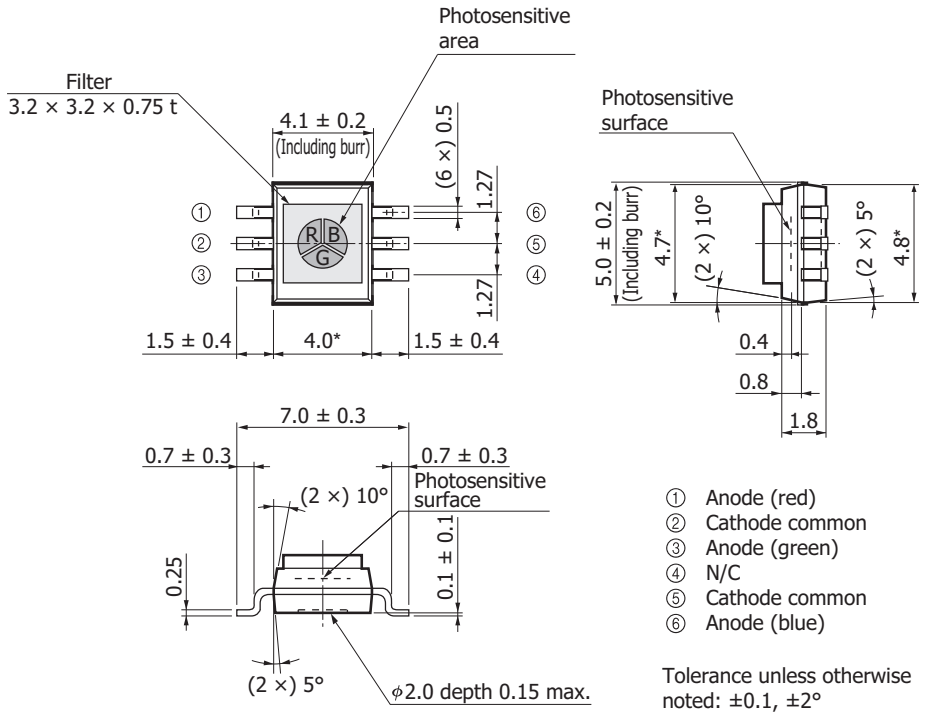
KSPDB0218EA

Terminal capacitance vs. reverse voltage



KSPDB0219EA

Dimensional outline (uint: mm)



① Anode (red)
② Cathode common
③ Anode (green)
④ N/C
⑤ Cathode common
⑥ Anode (blue)

Tolerance unless otherwise noted: ±0.1, ±2°
Shaded area indicates burr.

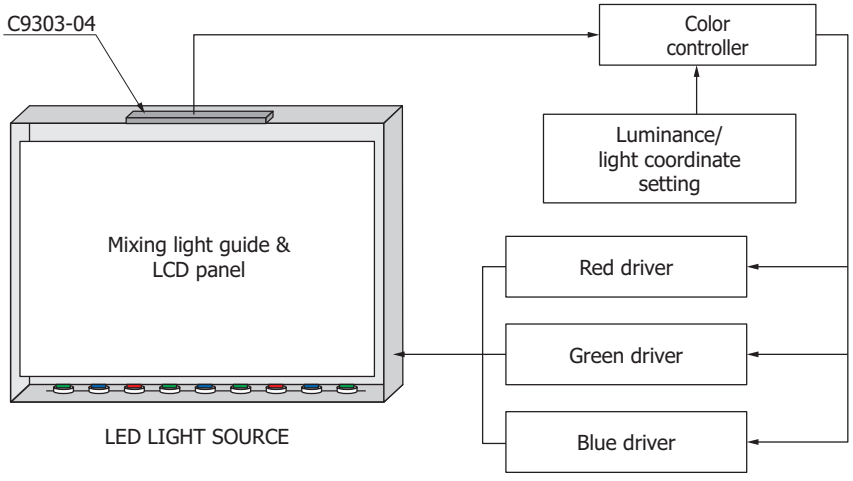
Chip position accuracy with respect to the package dimensions marked *
X, Y≤±0.2, θ≤±2°
Lead surface finish: silver plating
Packing: stick (50 pcs/stick)

KSPDA0162EB

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

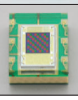
Optical feedback of backlight for TFT-LCD using a color sensor module C9303-04 (integrated with the S9032-02)



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

KACCC0289EA

Line-up of RGB color sensors

Type no.	Type	Photosensitive area size (mm)	Package (mm)	Peak sensitivity wavelength (nm)	Photo sensitivity						Photo
S9032-02	Photodiode	 ϕ2.0	4 × 4.8 × 1.8[t] 6-pin (filter 0.75[t])	B 460	B	0.18 (A/W) [λ=460 nm]					
				G 540	G	0.23 (A/W) [λ=540 nm]					
				R 620	R	0.16 (A/W) [λ=620 nm]					
S9702	Photodiode	 1.0 × 1.0	3 × 4 × 1.3[t] 4-pin (filter 0.75[t])	B 460	B	0.18 (A/W) [λ=460 nm]					
				G 540	G	0.23 (A/W) [λ=540 nm]					
				R 620	R	0.16 (A/W) [λ=620 nm]					
S10917-35GT	Photodiode	 1.0 × 1.0	3 × 1.6 × 1.0[t] COB (on-chip filter)	B 460	B	0.2 (A/W) [λ=460 nm]					
				G 540	G	0.23 (A/W) [λ=540 nm]					
				R 620	R	0.17 (A/W) [λ=620 nm]					
S10942-01CT	Photodiode	 1.0 × 1.0	3 × 1.6 × 1.0[t] COB (on-chip filter)	*	B	0.21 (A/W) [λ=460 nm]					
					G	0.25 (A/W) [λ=540 nm]					
					R	0.45 (A/W) [λ=640 nm]					
S9706	Digital photo IC	 1.2 × 1.2	4 × 4.8 × 1.8[t] 6-pin (filter 0.75[t])	B 465	Low	B	0.21 (LSB/lx)	High	B	1.9 (LSB/lx)	
				G 540		G	0.45 (LSB/lx)		G	4.1 (LSB/lx)	
				R 615		R	0.64 (LSB/lx)		R	5.8 (LSB/lx)	
S11012-01CR	Digital photo IC	 1.2 × 1.2	3.43 × 3.8 × 1.6[t] COB (on-chip filter)	B 465	Low	B	0.3 (LSB/lx)	High	B	2.6 (LSB/lx)	
				G 540		G	0.6 (LSB/lx)		G	5.3 (LSB/lx)	
				R 615		R	1.4 (LSB/lx)		R	12.9 (LSB/lx)	

* Refer to "Spectral response" of "Si photodiode S10942-01CT" datasheet.

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Cat. No. KSPD1067E07 Oct. 2011 DN