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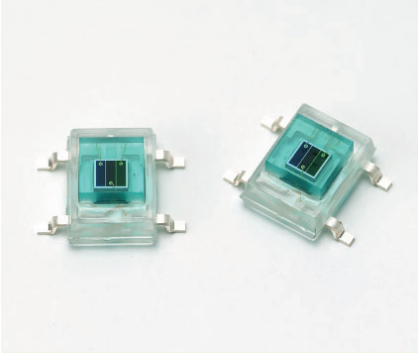
Si photodiode



S9702

RGB color sensor

The S9702 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 S9702 has a 3-segment (RGB) photosensitive area of □1 mm. When compared to the previous model (S9032-02), the S9702 is significantly miniaturized (package size 55% less in cubic volume, PC board mount space 43% less in area).

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) photosensitive area of □1 mm**

Applications

- **Portable or mobile equipment**
- **RGB-LCD backlight monitors**
- **Detectors for various light sources**
- **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

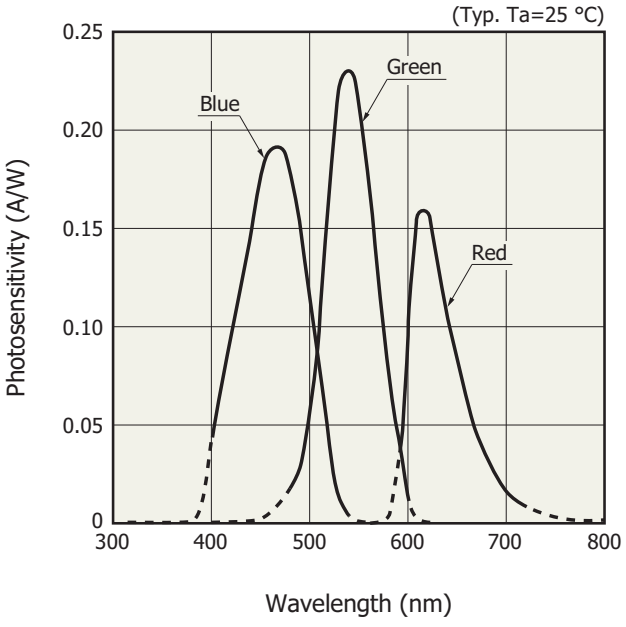
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta= 25 °C, 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	-	
Photosensitivity	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		-	1	50	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%		-	0.1	1.0	μs
Terminal capacitance	Ct	V_R=0 V, f=10 kHz		-	12	25	pF

This product does not support lead-free soldering. For details on reflow soldering conditions, please contact our sales office.

Spectral response



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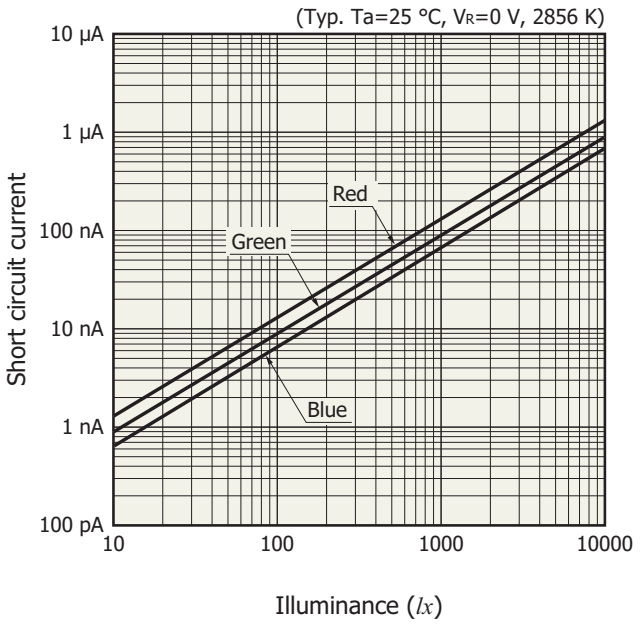
Linearity



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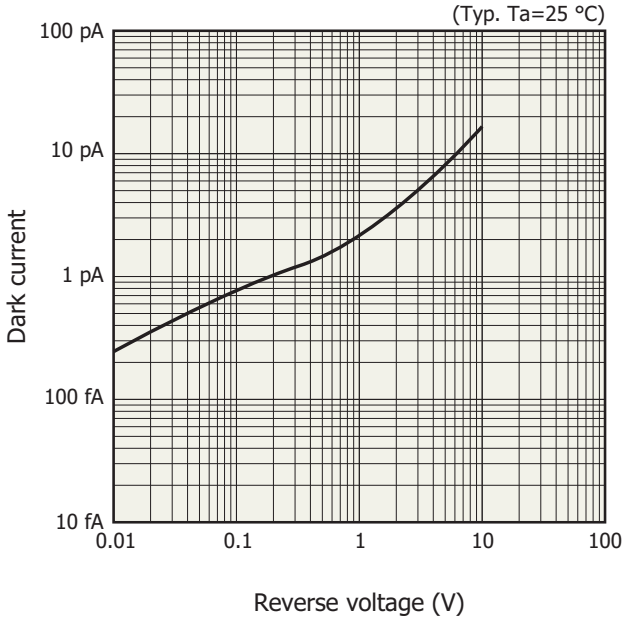
Dark current vs. reverse voltage



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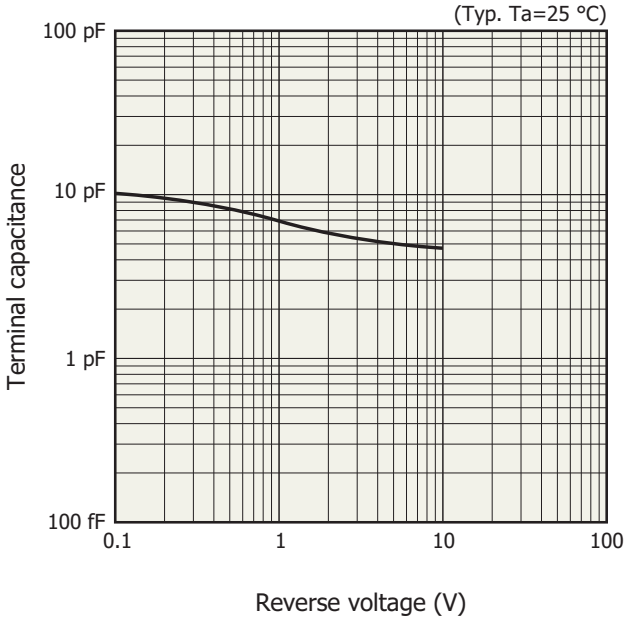
Terminal capacitance vs. reverse voltage



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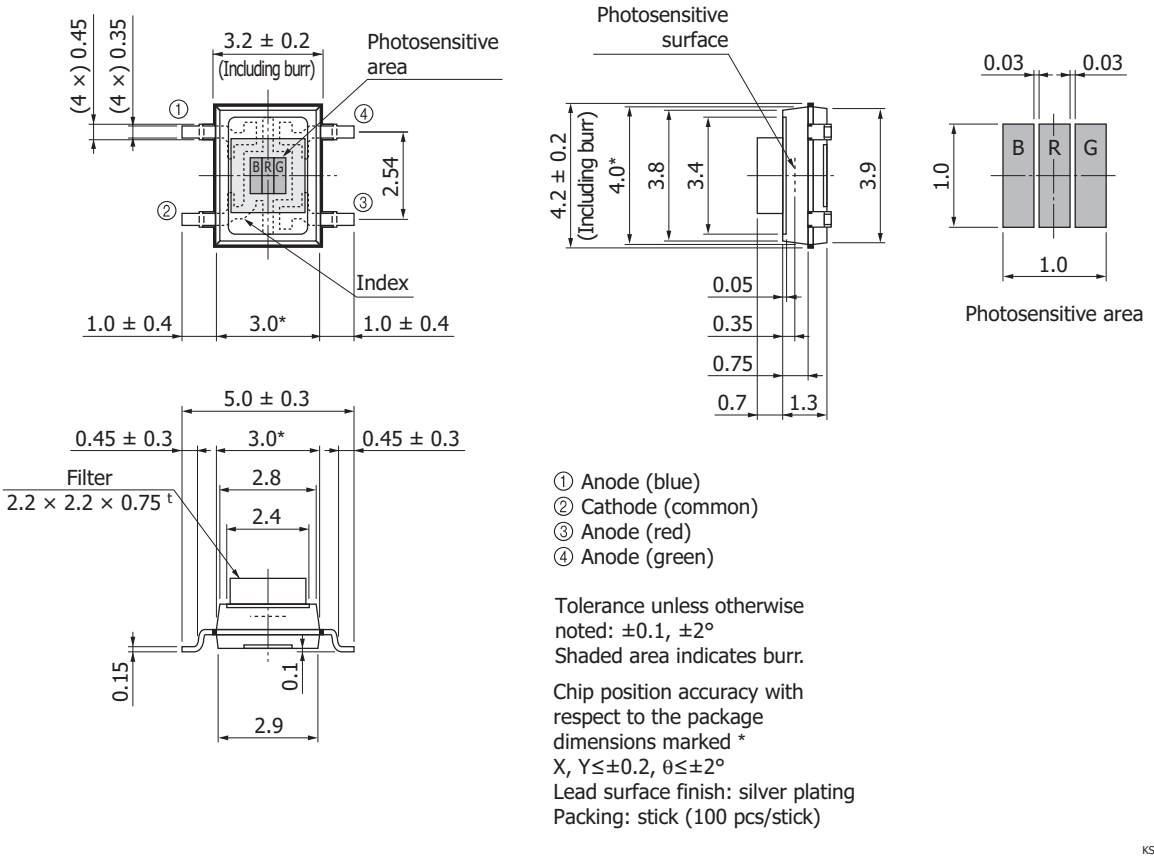
Dimensional outline (uint: mm)



① Anode (blue)
② Cathode (common)
③ Anode (red)
④ Anode (green)

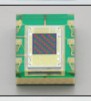
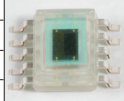
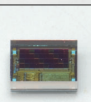
Tolerance unless otherwise noted: ±0.1, ±2°
Shaded area indicates burr.

Chip position accuracy with respect to the package dimensions marked *
X, Y≤±0.2, θ≤±2°
Lead surface finish: silver plating
Packing: stick (100 pcs/stick)

KSPDA0170EC

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.

Line-up of RGB color sensors

Type no.	Type	Photosensitive area size (mm)	Package (mm)	Peak sensitivity wavelength (nm)	Photosensitivity	Photo
S9032-02	Photodiode	 ϕ2.0	4 × 4.8 × 1.8[t] 6-pin (filter 0.75[t])	B 460 G 540 R 620	B 0.18 (A/W) [λ=460 nm] G 0.23 (A/W) [λ=540 nm] 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 G 540 R 620	B 0.18 (A/W) [λ=460 nm] G 0.23 (A/W) [λ=540 nm] 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 G 540 R 620	B 0.2 (A/W) [λ=460 nm] G 0.23 (A/W) [λ=540 nm] 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 G 540 R 615	Low: B 0.21 (LSB/lx) Low: G 0.45 (LSB/lx) Low: R 0.64 (LSB/lx)	High: B 1.9 (LSB/lx) High: G 4.1 (LSB/lx) High: 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)	*	Low: B 0.3 (LSB/lx) Low: G 0.6 (LSB/lx) Low: R 1.4 (LSB/lx)	High: B 2.6 (LSB/lx) High: G 5.3 (LSB/lx) High: R 12.9 (LSB/lx)	
S11059-02DT	I²C compatible color sensor	 0.54 × 1.1	3 × 4.2 × 1.3[t] 10-pin (on-chip filter)	B 460 G 530 R 615 IR 855	Low: B 4.4 (count/lx) Low: G 8.3 (count/lx) Low: R 11.2 (count/lx) Low: IR 3.0 (count/lx)	High: B 44.8 (count/lx) High: G 85.0 (count/lx) High: R 117.0 (count/lx) High: IR 30.0 (count/lx)	
S11059-01WT	I²C interface-compatible color sensor	 1.22 × 0.56	1.68 × 1.18 × 0.58[t] WL-CSP (on-chip filter)	B 460 G 530 R 615 IR 855	Low: B 3.35 (count/lx) Low: G 7.61 (count/lx) Low: R 9.48 (count/lx) Low: IR 1.66 (count/lx)	High: B 31.7 (count/lx) High: G 76.2 (count/lx) High: R 94.5 (count/lx) High: IR 15.3 (count/lx)	

* Refer to "Spectral response" of each datasheet.

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