

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 ($\lambda_p=460$ nm), green ($\lambda_p=540$ nm) and red ($\lambda_p=620$ nm) regions of the spectrum. The S9702 has a 3-segment (RGB) active area of $\square 1$ 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
- Active area: 3-segment (RGB) active area of $\square 1$ mm

Applications

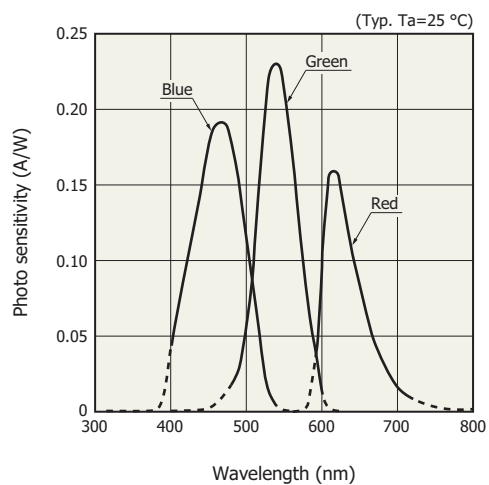
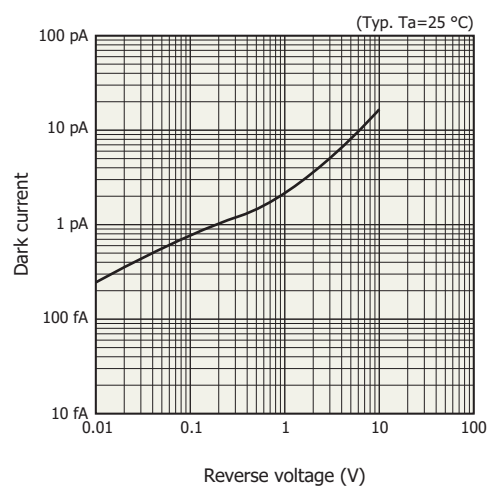
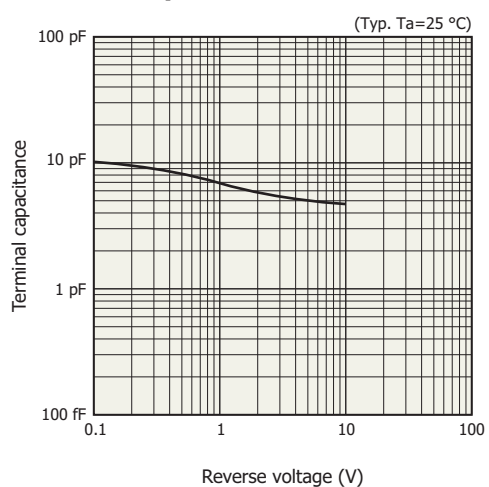
- Portable or mobile equipment
- RGB-LCD backlight monitors
- Detectors for various light sources
- Color detection

Absolute maximum ratings

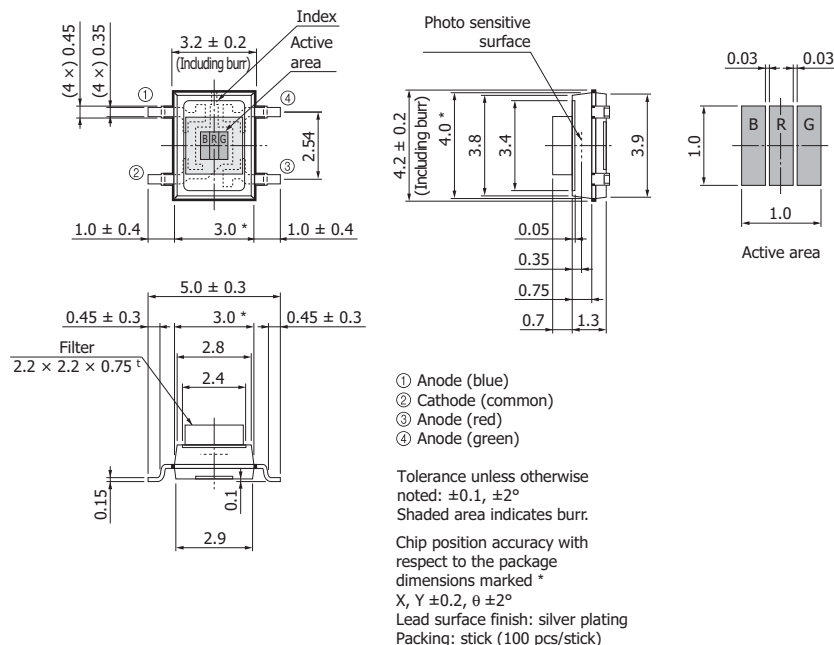
Parameter	Symbol	Value	Unit
Reverse voltage	V_R Max.	10	V
Operating temperature	T_{opr}	-25 to +85	°C
Storage temperature	T_{stg}	-40 to +85	°C

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	-	1	50	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 %	-	0.1	1.0	μ s
Terminal capacitance	C_t	$V_R = 0$ V, $f = 10$ kHz	-	12	25	pF

Spectral response**Dark current vs. reverse voltage****Terminal capacitance vs. reverse voltage**

Dimensional outline (unit: mm)



KSPDA0170EA

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	Active 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]				
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)	
				B	460		B	4.0 (counts/lx)		B	40.6 (counts/lx)	
S11059-78HT	I ² C interface- compatible color sensor	 1.1 × 0.52	1.18 × 1.68 × 0.58 ^t WL-CSP (on-chip filter)	G	530	Low	B	8.3 (counts/lx)	High	G	86.5 (counts/lx)	
				R	615		R	10.6 (counts/lx)		R	108.3 (counts/lx)	
				IR	855		IR	3.7 (counts/lx)		IR	25.8 (counts/lx)	

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