

Si photodiode S10170

RGB color sensor integrated in small and thin package



S10170 is a color sensor molded into a plastic package having a 3-channel (RGB) photodiode sensitive to the Red ($\lambda=590$ nm Min.), Green ($\lambda=480$ to 600 nm) and Blue ($\lambda=400$ to 540 nm) regions of the spectrum. When compared to the previous model (S9702), S10170 is significantly miniaturized the package size by 80 % in cubic volume and PC board mount space by 77 % in area. S10170 is ideal for RGB-LCD backlight monitors installed in such as mobile phones.

Features

- 3-channel (R, G, B) Si photodiode
- Small, thin package: $3.0 \times 1.6 \times 10$ mm
- Active area: 1×1 mm/3-segment (RGB)
- RoHS-compatible
- Surface mount type

Applications

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

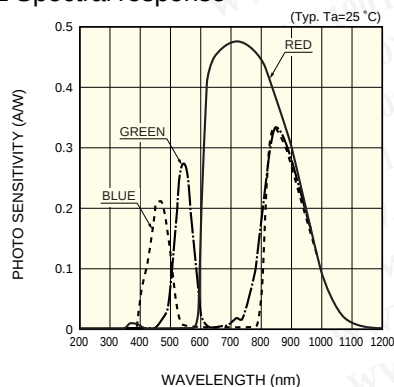
Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	VR Max	10	V
Operating temperature	Topr	-25 to +85	°C
Storage temperature	Tstg	-40 to +100	°C

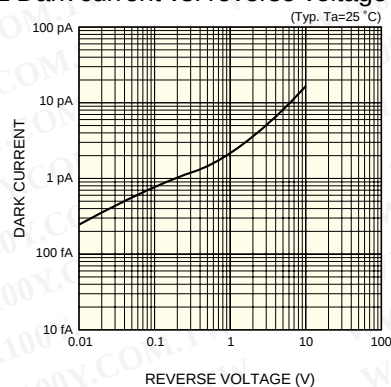
Electrical and optical characteristics (Ta=25 °C, per element)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	Blue	-	400 to 540 800 to 1000	-	nm
		Green	-	480 to 600 760 to 1000	-	
		Red	-	590 to 1000	-	
Photo sensitivity	S	Blue ($\lambda=460$ nm)	0.16	0.21	-	A/W
		Green ($\lambda=540$ nm)	0.23	0.28	-	
		Red ($\lambda=640$ nm)	0.40	0.45	-	
Dark current	ID	VR=1 V, All elements	-	1	50	pA
Temperature coefficient of ID	TCID		-	1.12	-	times/°C
Rise time	tr	VR=0 V, RL=1 k Ω , 10 to 90 %	-	0.1	-	μ s
Terminal capacitance	Ct	VR=0 V, f=10 kHz	-	12	25	pF

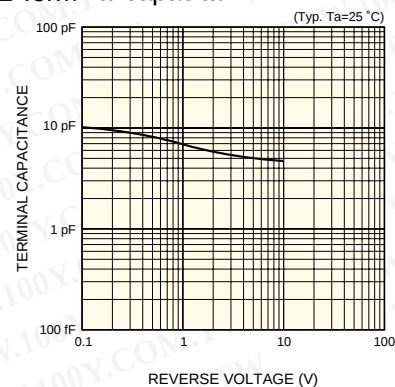
Spectral response



Dark current vs. reverse voltage

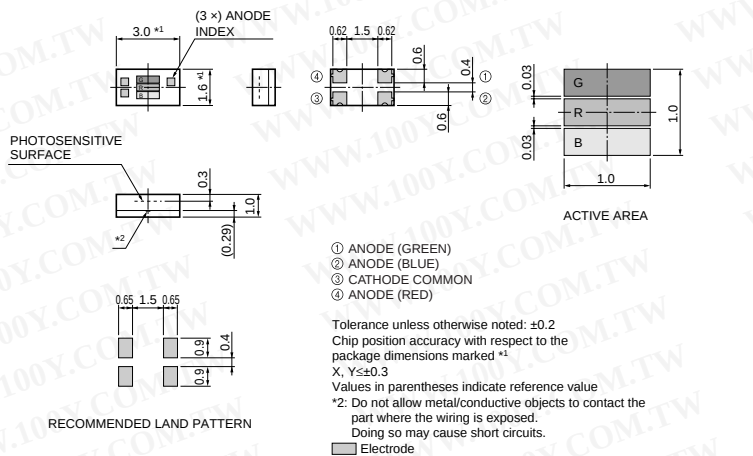


Terminal capacitance vs. reverse voltage



Since this photodiode has sensitivity in the infrared region, infrared light must be filtered out as needed.

■ Dimensional outline (unit: mm)



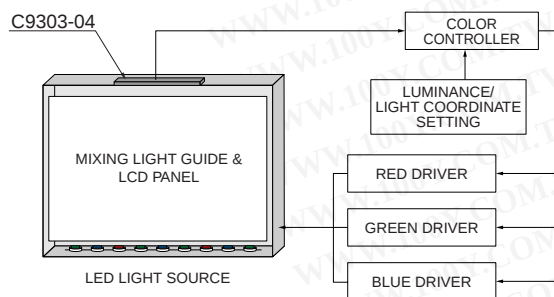
勝特力材料 886-3-5753170
 勝特力电子(上海) 86-21-54151736
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

■ 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 $V_R = 1V$ all elements Max. (pA)	Active area (mm)		Package
S7505-01	B	400 to 540	460	B	0.18	200	B	$1.5 \times 1.5 (\times 2)$	Surface-mount type plastic
	G	480 to 600	540	G	0.23		G	1.5×1.5	
	R	590 to 720	620	R	0.16		R	1.5×1.5	
S9032-02	B	400 to 540	460	B	0.18	100	$\phi 2/3$ -element		Surface-mount type plastic
	G	480 to 600	540	G	0.23				
	R	590 to 720	620	R	0.16				
S9702	B	400 to 540	460	B	0.18	50	$1 \times 1/3$ -element		Surface-mount type, miniature plastic
	G	480 to 600	540	G	0.23				
	R	590 to 720	620	R	0.16				
S8751	B	400 to 540	460	B	0.21	100	1×1		Surface-mount type plastic
	G	480 to 600	540	G	0.25				
	R	590 to 720	660	R	0.42				
S8752	B	400 to 540	460	B	0.21		1×1		Plastic
	R	590 to 720	660	R	0.42				

■ Application example

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



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

KACCC0289EA

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