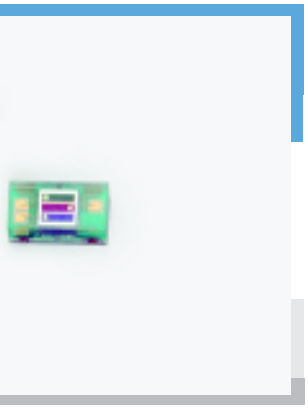
Si photodiode
S10170

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 (λ=590 nm Min.), Green (λ=480 to 600 nm) and Blue (λ=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 × 1.6 × 10 ^{t}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

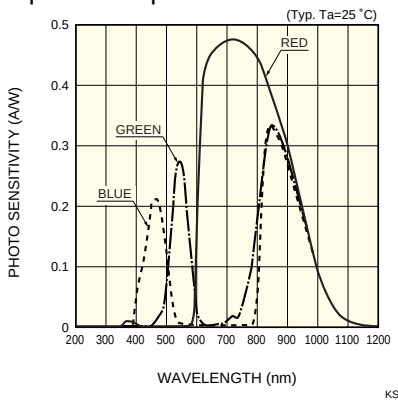
■ Absolute maximum ratings

Parameter	Symbol	Value	Unit
Reverse voltage	V_R 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)

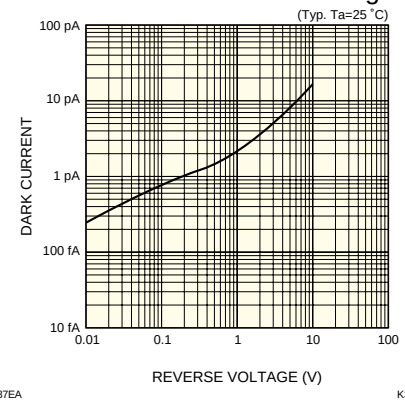
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	Blue	-	400 to 540 800 to 1000	-	nm
		Green	-	480 to 600 760 to 1000	-	
		Red	-	590 to 1000	-	
Photo sensitivity	S	Blue (λ=460 nm)	0.16	0.21	-	A/W
		Green (λ=540 nm)	0.23	0.28	-	
		Red (λ=640 nm)	0.40	0.45	-	
Dark current	I_D	V_R=1 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	-	μs
Terminal capacitance	Ct	V_R=0 V, f=10 kHz	-	12	25	pF

■ Spectral response



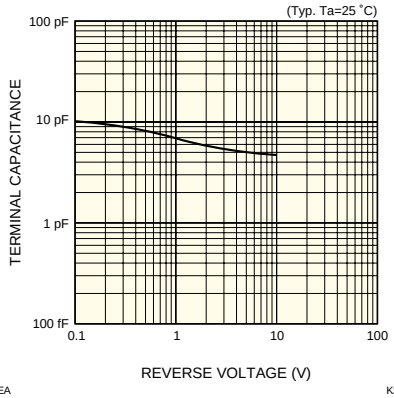
KSPDB0287EA

■ Dark current vs. reverse voltage



KSPDB0252EA

■ Terminal capacitance vs. reverse voltage

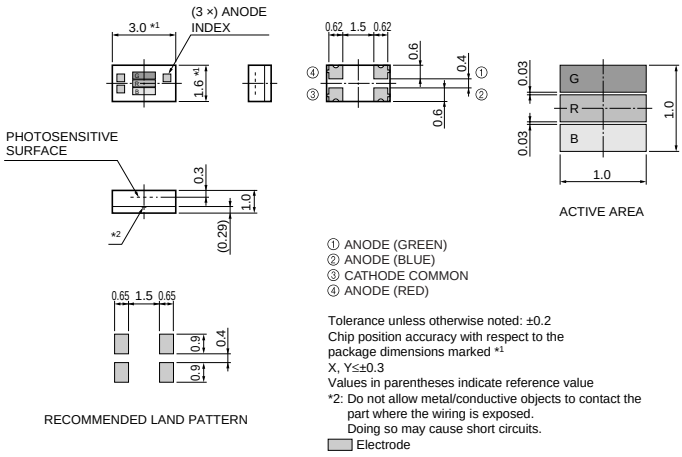


KSPDB0253EA

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

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■ Dimensional outline (unit: mm)



① ANODE (GREEN)
② ANODE (BLUE)
③ CATHODE COMMON
④ ANODE (RED)

Tolerance unless otherwise noted: ±0.2
Chip position accuracy with respect to the package dimensions marked *1
X, Y≤±0.3
Values in parentheses indicate reference value
*2: Do not allow metal/conductive objects to contact the part where the wiring is exposed. Doing so may cause short circuits.
Electrode

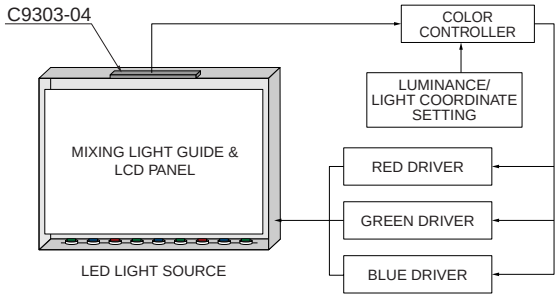
KSPDA0174EA

■ Line-up of RGB color sensors

Type No.	Spectral response range (nm)		Peak sensitivity wavelength (nm)	Photo sensitivity λ=λp (A/W)		Dark current VR=1 V all elements Max. (pA)	Active area (mm)		Package
S7505-01	B	400 to 540	460	B	0.18	200	B	1.5 × 1.5 (× 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	ϕ2/3-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 × 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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