

S10917-35GT

## RGB color sensor integrated in small and thin package

The S10917-35GT is a compact color sensor with a 3-channel photodiode mounted in one package, and sensitive to red ( $\lambda=590$  to 680 nm), green ( $\lambda=470$  to 600 nm) and blue ( $\lambda=390$  to 530 nm) light. An infrared-cut filter is formed on the photosensitive area. This color sensor achieves superior cost performance and is suitable for monitoring brightness of RGB-LED backlight LCD in hand-held devices such as cell phones.

### Features

- Infrared-cut filter formed on active area
- Superior cost performance
- Small, thin package: 3.0 × 1.6 × 1.0 mm
- 3-channel (RGB) Si photodiode
- Photosensitive area: 1 × 1 mm/3-segment (RGB)
- RoHS-compatible
- Surface mount type

### Applications

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

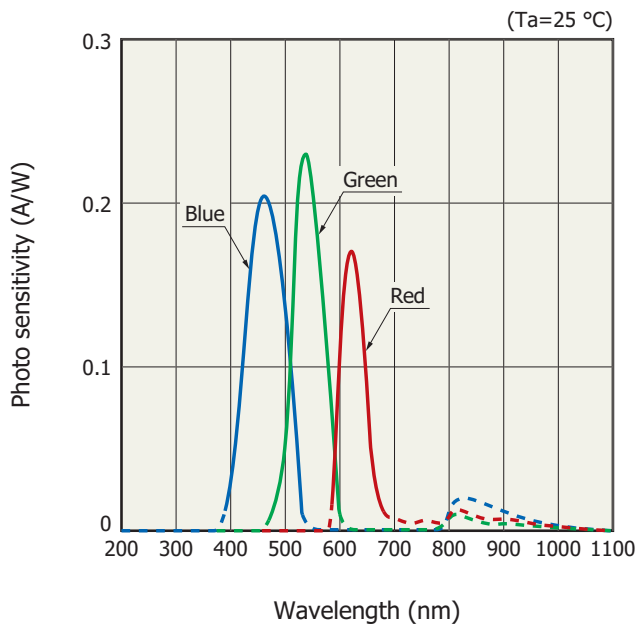
### Absolute maximum ratings

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

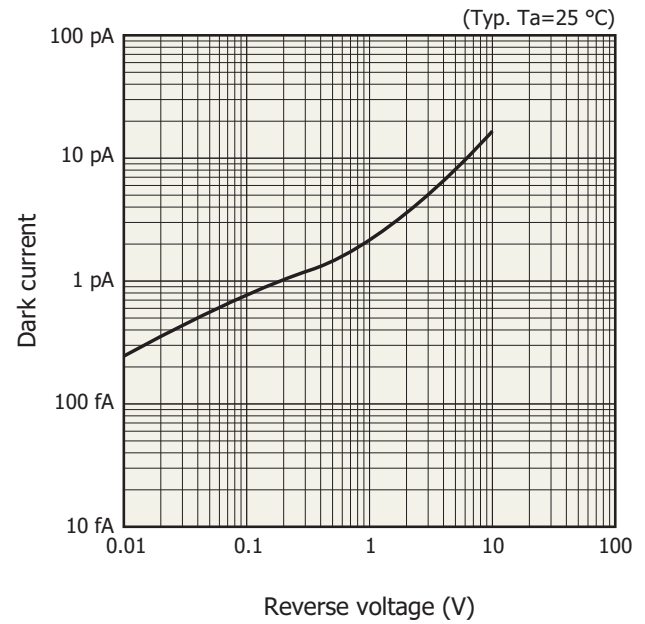
### Electrical and optical characteristics ( $T_a=25$ °C, per element)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$	Blue	-	390 to 530	-	nm
		Green	-	470 to 600	-	
		Red	-	590 to 680	-	
Peak sensitivity wavelength	$\lambda_p$	Blue	-	460	-	nm
		Green	-	540	-	
		Red	-	620	-	
Photo sensitivity	S	Blue ( $\lambda=\lambda_p$ )	0.15	0.2	0.25	A/W
		Green ( $\lambda=\lambda_p$ )	0.18	0.23	0.28	
		Red ( $\lambda=\lambda_p$ )	0.12	0.17	0.22	
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 $\Omega$ , 10 to 90%	-	0.1	0.5	$\mu$ s
Terminal capacitance	$C_t$	$V_R=0$ V, $f=10$ kHz	5	12	25	pF

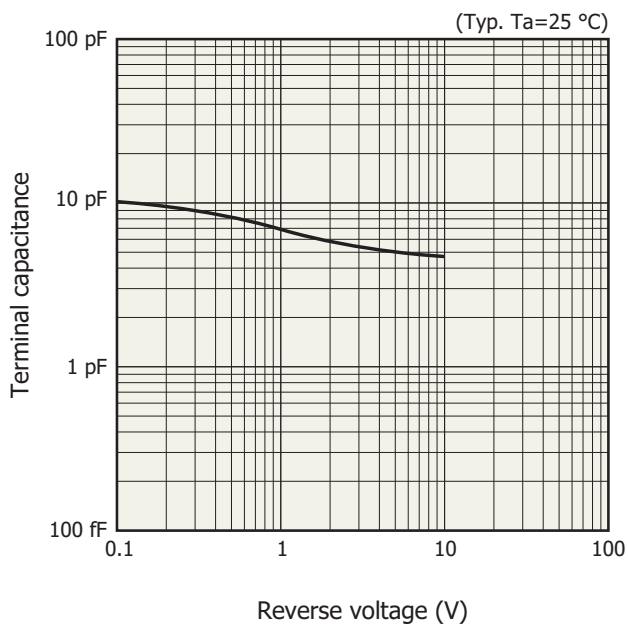
## Spectral response (measurement example)



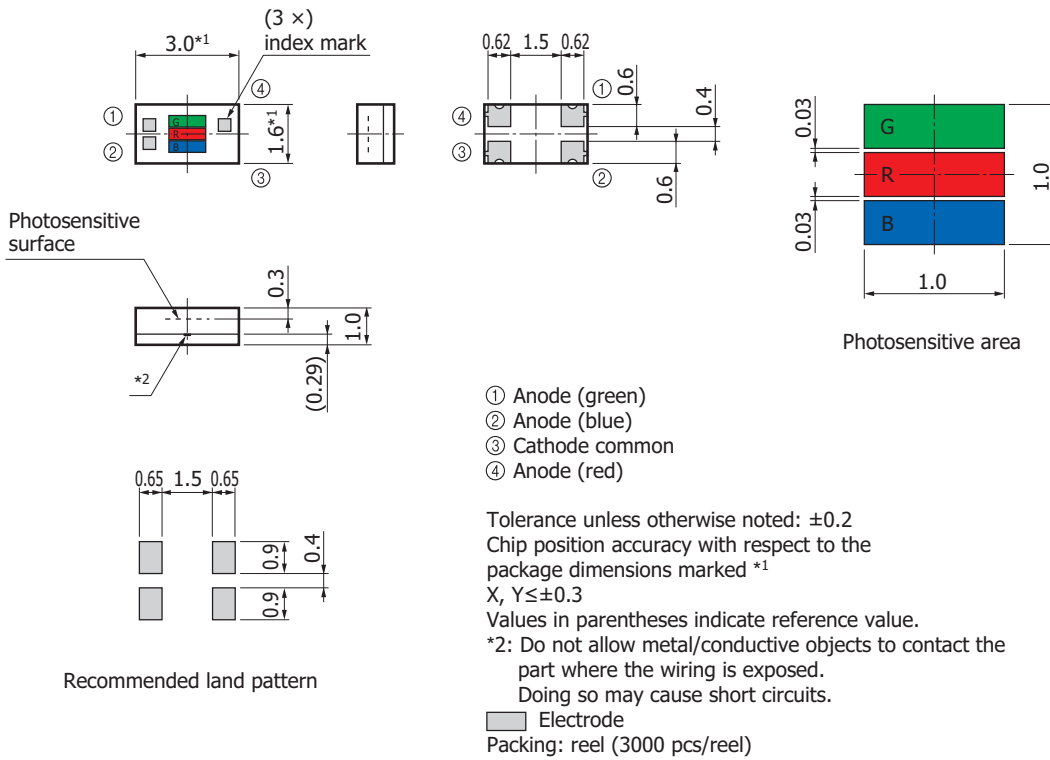
## Dark current vs. reverse voltage



## Terminal capacitance vs. reverse voltage












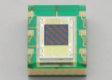


### Dimensional outline (unit: mm)



KSPDA0174ED

### 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	 $\phi 2.0$	4 × 4.8 × 1.8 <sup>t</sup> 6-pin (filter 0.75 <sup>t</sup> )	B 460	B	0.18 (A/W) [ $\lambda=460$ nm]								
				G 540	G	0.23 (A/W) [ $\lambda=540$ nm]								
				R 620	R	0.16 (A/W) [ $\lambda=620$ nm]								
S9702	Photodiode	 1.0 × 1.0	3 × 4 × 1.3 <sup>t</sup> 4-pin (filter 0.75 <sup>t</sup> )	B 460	B	0.18 (A/W) [ $\lambda=460$ nm]								
				G 540	G	0.23 (A/W) [ $\lambda=540$ nm]								
				R 620	R	0.16 (A/W) [ $\lambda=620$ nm]								
S10917-35GT	Photodiode	 1.0 × 1.0	3 × 1.6 × 1.0 <sup>t</sup> COB (on-chip filter)	B 460	B	0.2 (A/W) [ $\lambda=460$ nm]								
				G 540	G	0.23 (A/W) [ $\lambda=540$ nm]								
				R 620	R	0.17 (A/W) [ $\lambda=620$ nm]								
S10942-01CT	Photodiode	 1.0 × 1.0	3 × 1.6 × 1.0 <sup>t</sup> COB (on-chip filter)	*	B	0.21 (A/W) [ $\lambda=460$ nm]								
					G	0.25 (A/W) [ $\lambda=540$ nm]								
					R	0.45 (A/W) [ $\lambda=640$ nm]								
S9706	Digital photo IC	 1.2 × 1.2	4 × 4.8 × 1.8 <sup>t</sup> 6-pin (filter 0.75 <sup>t</sup> )	B 465	Low	B	0.21 (LSB/lx)	High	B	1.9 (LSB/lx)				
				G 540					G	4.1 (LSB/lx)				
				R 615					R	5.8 (LSB/lx)				
S11012-01CR	Digital photo IC	 1.2 × 1.2	3.43 × 3.8 × 1.6 <sup>t</sup> COB (on-chip filter)	B 465	Low	B	0.3 (LSB/lx)	High	B	2.6 (LSB/lx)				
				G 540					G	5.3 (LSB/lx)				
				R 615					R	12.9 (LSB/lx)				
				B 465	High	B	0.6 (LSB/lx)	Low	B	0.3 (LSB/lx)		High	B	2.6 (LSB/lx)
				G 540									G	5.3 (LSB/lx)
				R 615									R	12.9 (LSB/lx)

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

Information described in this material is current as of October, 2011.

Product specifications are subject to change without prior notice due to improvements or other reasons. Before assembly into final products, please contact us for the delivery specification sheet to check the latest information.

Type numbers of products listed in the delivery specification sheets or supplied as samples may have a suffix "(X)" which means preliminary specifications or a suffix "(Z)" which means developmental specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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