

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 photosensitive 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

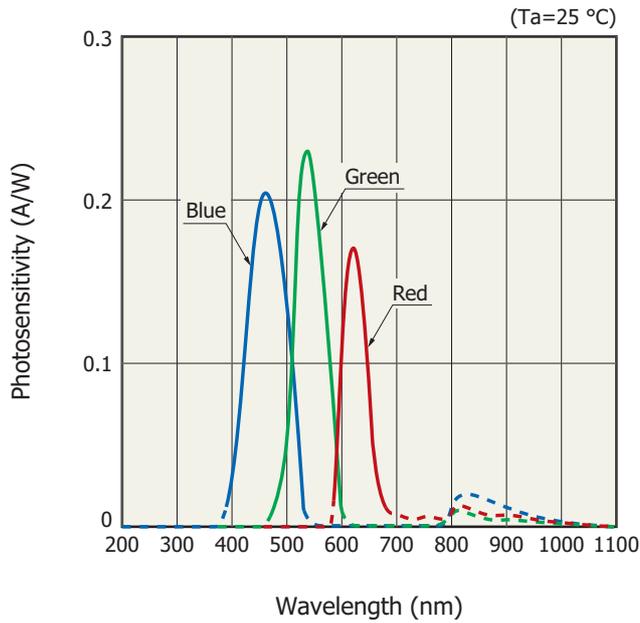
Parameter	Symbol	Value	Unit
Reverse voltage	V_R max	10	V
Operating temperature	T_{opr}	-25 to +85	°C
Storage temperature	T_{stg}	-40 to +85	°C

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 ($T_a=25$ °C, per element)

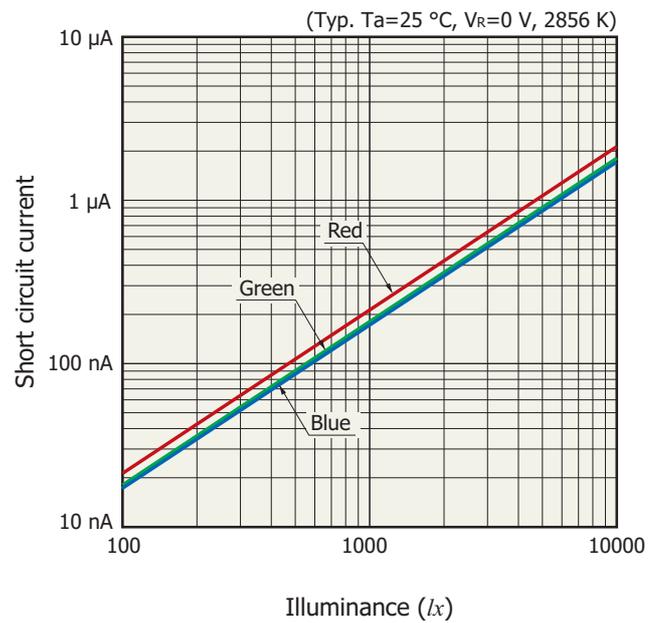
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	λ	Blue	-	390 to 530	-	nm
		Green	-	470 to 600	-	
		Red	-	590 to 680	-	
Peak sensitivity wavelength	λ_p	Blue	-	460	-	nm
		Green	-	540	-	
		Red	-	620	-	
Photosensitivity	S	Blue ($\lambda=\lambda_p$)	0.15	0.2	0.25	A/W
		Green ($\lambda=\lambda_p$)	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	tr	$V_R=0$ V, $R_L=1$ k Ω , 10 to 90%	-	0.1	0.5	μ s
Terminal capacitance	Ct	$V_R=0$ V, f=10 kHz	5	12	25	pF

Spectral response (typical example)



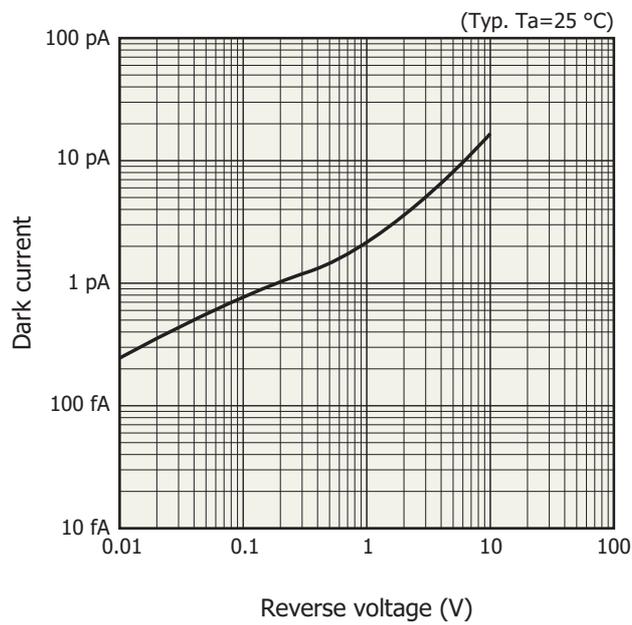
KSPDB0295EA

Linearity



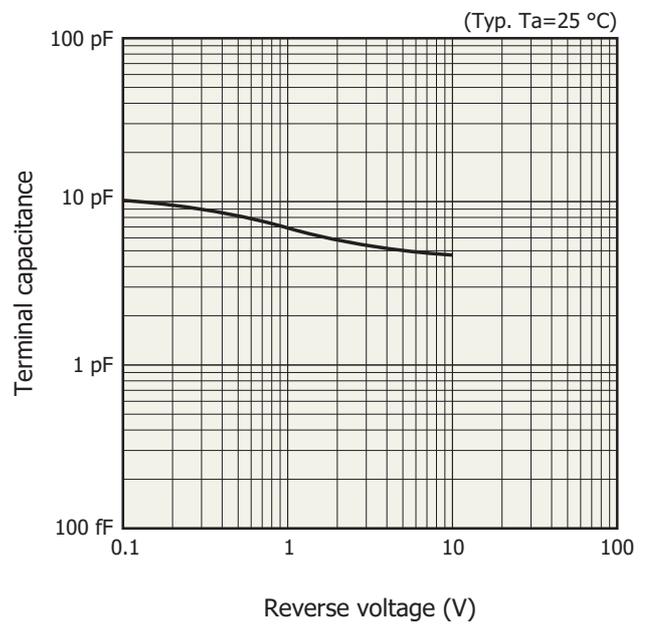
KSPDB0328EA

Dark current vs. reverse voltage



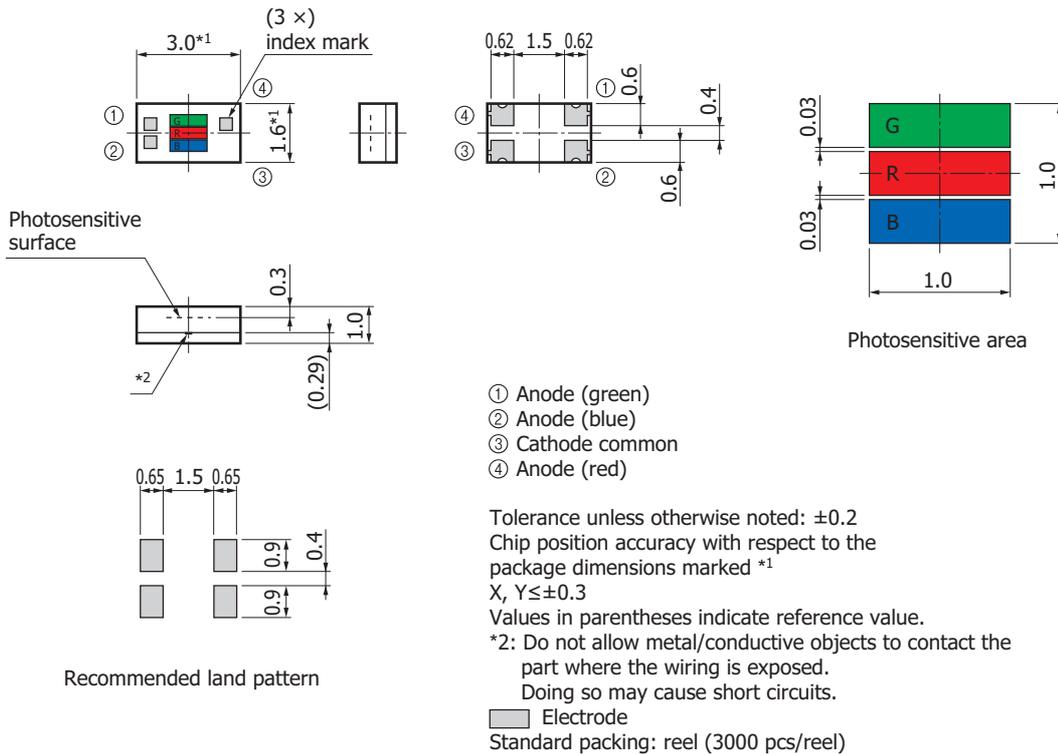
KSPDB0252EA

Terminal capacitance vs. reverse voltage



KSPDB0253EA

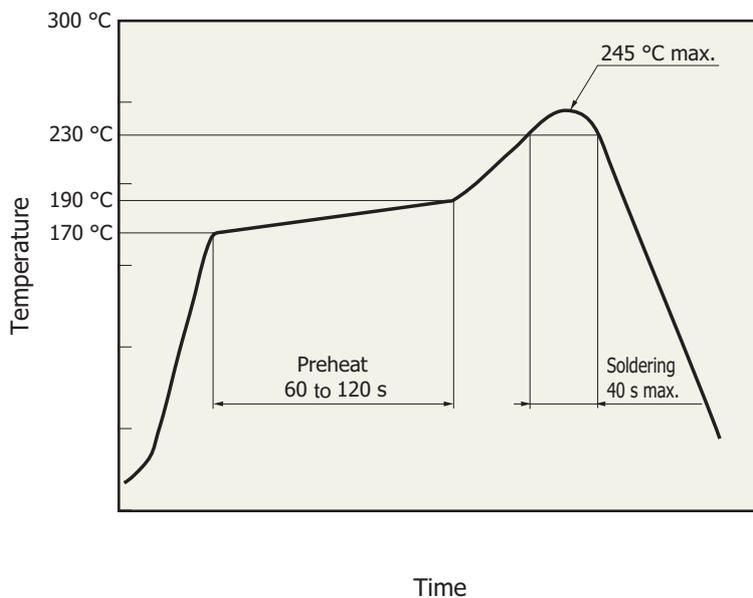
Dimensional outline (unit: mm)



KSPDA0174ED

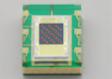
Measured example of temperature profile with our hot-air reflow oven for product testing

This product supports lead-free soldering. After unpacking, store it in an environment at a temperature of 30 °C or less and a humidity of 60% or less, and perform soldering within 24 hours.



KSPDB0139EA

Lineup of RGB color sensors

Type no.	Type	Photosensitive area (mm)	Package (mm)	Peak sensitivity wavelength (nm)		Photosensitivity				Photo		
				B	G	R	B	G	R		IR	
S9032-02	Photodiode	 $\phi 2.0$	4 × 4.8 × 1.8 ^t 6 pin (filter 0.75 ^t)	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 ^t 4 pin (filter 0.75 ^t)	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 ^t 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 ^t 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 ^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)	
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)	High	B	2.6 (LSB/lx)	
							G	0.6 (LSB/lx)		G	5.3 (LSB/lx)	
							R	1.4 (LSB/lx)		R	12.9 (LSB/lx)	
S11059-02DT /-03DS	I ² C compatible color sensor	 0.56 × 1.22	3 × 4.2 × 1.3 ^t 10 pin (on-chip filter)	B	460	Low	B	4.4 (count/lx)	High	B	44.8 (count/lx)	
				G	530		G	8.3 (count/lx)		G	85.0 (count/lx)	
				R	615		R	11.2 (count/lx)		R	117.0 (count/lx)	
				IR	855		IR	3.0 (count/lx)		IR	30.0 (count/lx)	

* Refer to the spectral response of each product's datasheet.

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

Precautions

- Disclaimer
- Metal, ceramic, Plastic Package products
- Surface mount type products

Information described in this material is current as of February, 2016.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

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