

S10942-01CT

RGB color sensor integrated in small and thin package

The S10942-01CT 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), the S10942-01CT is significantly miniaturized the package size by 80% in cubic volume and PC board mount space by 77% in area. The S10942-01CT is ideal for RGB-LCD backlight monitors installed in such as mobile phones.

Features

- Small, thin package: $3.0 \times 1.6 \times 1.0$ mm
- 3-channel (RGB) Si photodiode
- Photosensitive area: 1×1 mm/3-segment (RGB)
- RoHS compliant
- Surface mount type

Applications

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

Absolute maximum ratings

Parameter	Symbol	Condition	Value	Unit
Reverse voltage	V_R max		10	V
Operating temperature	T_{opr}	No dew condensation*1	-25 to +85	°C
Storage temperature	T_{stg}	No dew condensation*1	-40 to +85	°C
Soldering temperature	T_{sol}		245 (once)*2	°C

*1: When there is a temperature difference between a product and the surrounding area in high humidity environment, dew condensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.

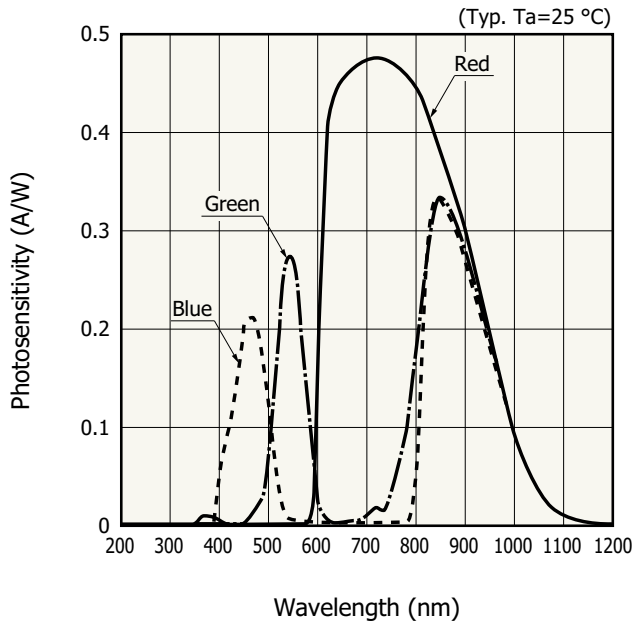
*2: Reflow soldering, IPC/JEDEC J-STD-020 MSL 5a, see P.5

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	-	400 to 540 800 to 1000	-	nm
		Green	-	480 to 600 760 to 1000	-	
		Red	-	590 to 1000	-	
Photosensitivity	S	Blue ($\lambda=460$ nm)	0.16	0.21	0.26	A/W
		Green ($\lambda=540$ nm)	0.20	0.25	0.30	
		Red ($\lambda=640$ nm)	0.40	0.45	0.50	
Dark current	I_D	$V_R=1$ V, All elements	-	1	50	pA
Temperature coefficient of I_D	TC_{ID}		-	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	5	12	25	pF

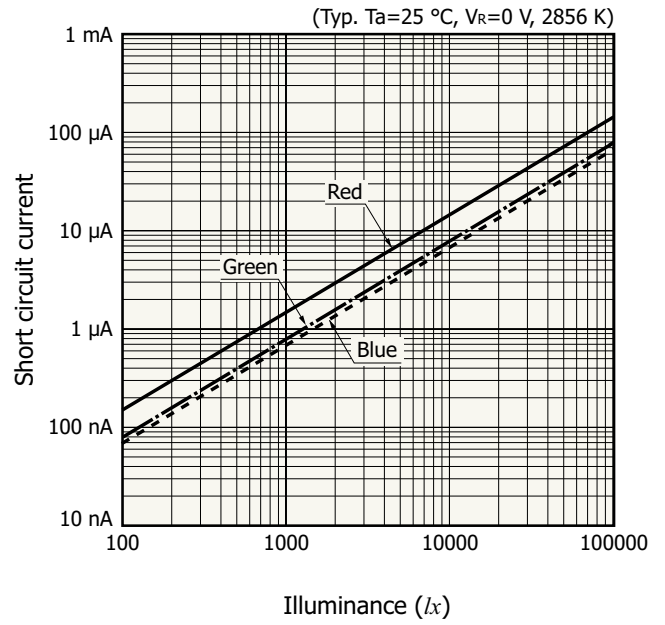
Spectral response



KSPDB0287EA

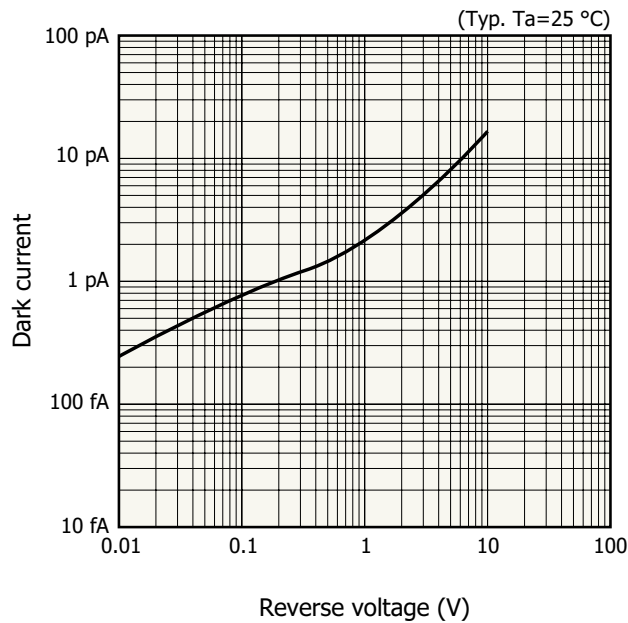
Since this photodiode has sensitivity in the infrared region, infrared light must be filtered out as needed.

Linearity



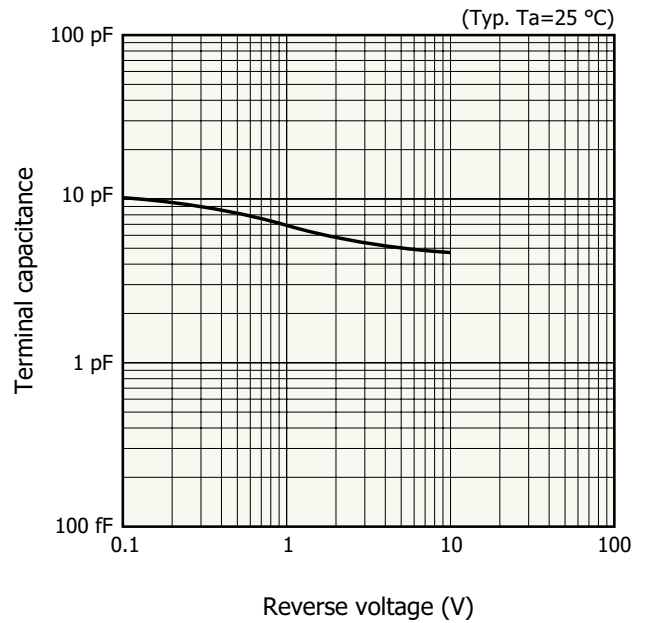
KSPDB0329EA

Dark current vs. reverse voltage



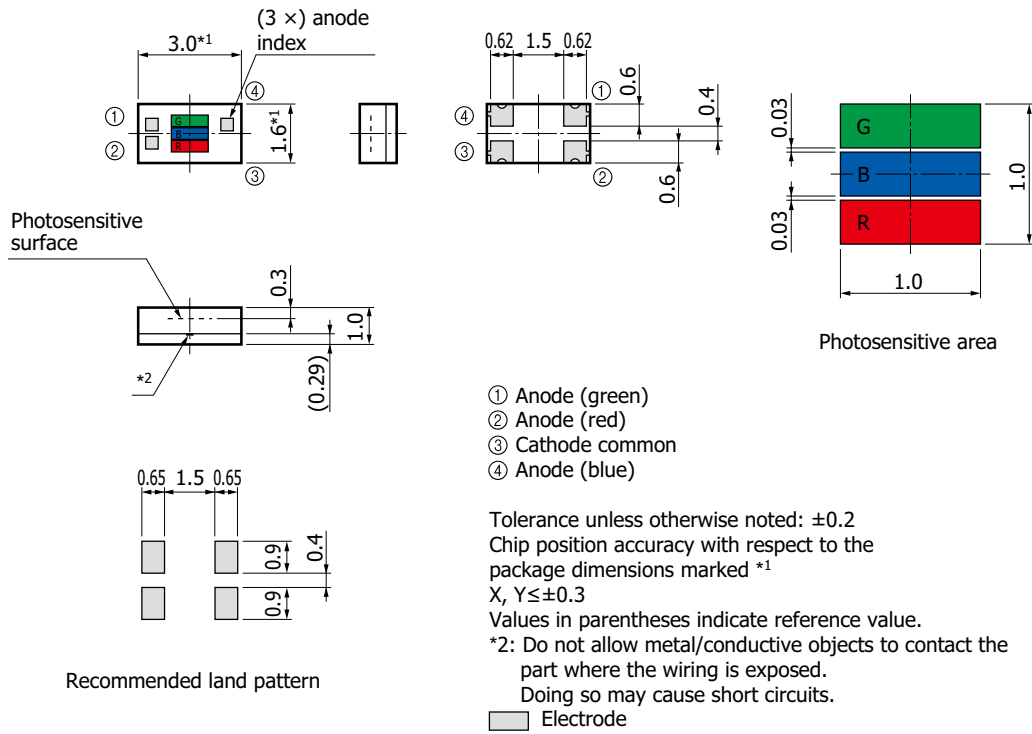
KSPDB0252EA

Terminal capacitance vs. reverse voltage



KSPDB0253EA

Dimensional outline (unit: mm)



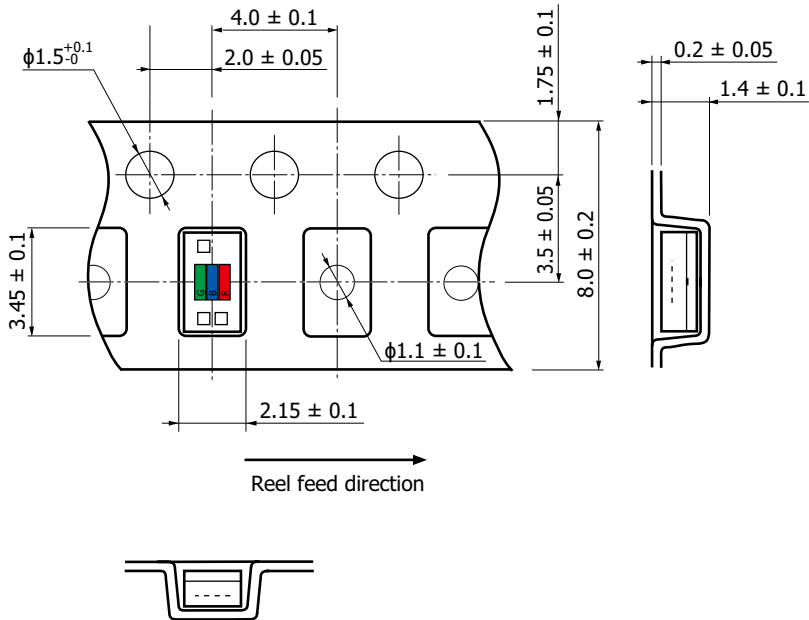
KSPDA0186EC

Reel packing specifications

- Reel (conforms to JEITA ET-7200)

Outer diameter	Hub diameter	Tape width	Material	Electrostatic characteristics
φ180 mm	φ60 mm	8 mm	PS	Antistatic treatment

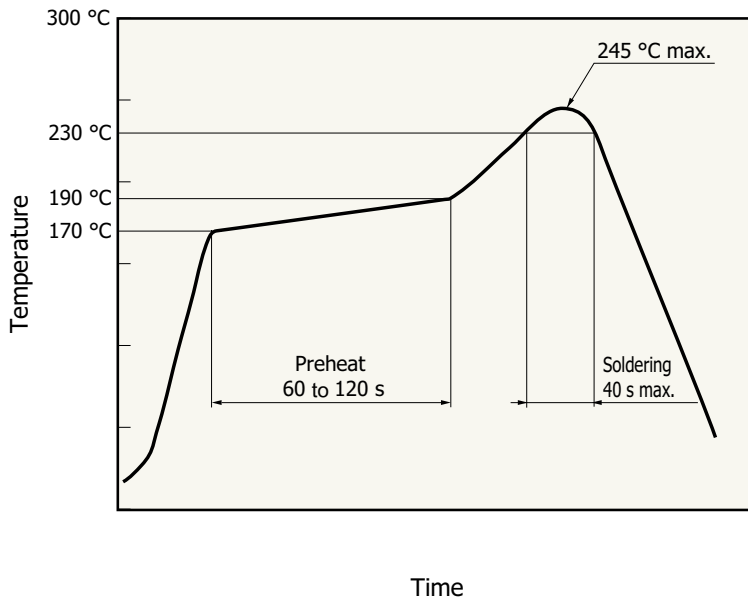
- Embossed tape (unit: mm, material: PS, electrically conductive)



KSPDC0108EA

- Packing quantity
3000 pcs/reel
- Packing type
Reel and desiccant in moisture-proof packaging (vacuum-sealed)

Recommended soldering conditions



KSPD0139EA

- 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.
- The effect that the product receives during reflow soldering varies depending on the circuit board and reflow oven that are used. Before actual reflow soldering, check for any problems by testing out the reflow soldering methods in advance.

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 December 2022.

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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