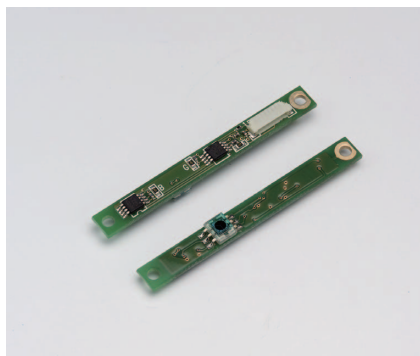


# Color sensor module



C9303-04

## RGB-LED backlight monitor for TFT-LCD (liquid crystal display)

The C9303-04 is a color sensor module that has a RGB color sensor and current-to-voltage conversion amplifier mounted on a small circuit board.

### Features

- **Built-in RGB color sensor**  
Sensitivity matches wavelengths of RGB-LED backlight for TFT-LCD.
- **3 ch current-to-voltage conversion amplifiers**  
Simultaneous output of 3 ch RGB photocurrent
- **Configuration and size suitable for side mounting to TFT-LCD**
- **Suitable for lead-free solder**
- **Pin compatible with previous device**
- **Low current consumption**

### Applications

- **RGB-LED backlight monitor for TFT-LCD**

### Absolute maximum ratings (Ta=25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Supply voltage	Vcc	+5.5	V
Reference voltage	VREF	Vcc - 0.4	V
Operating temperature*1	Topr	-20 to +85	°C
Storage temperature*1	Tstg	-20 to +85	°C

\*1: No dew condensation

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.

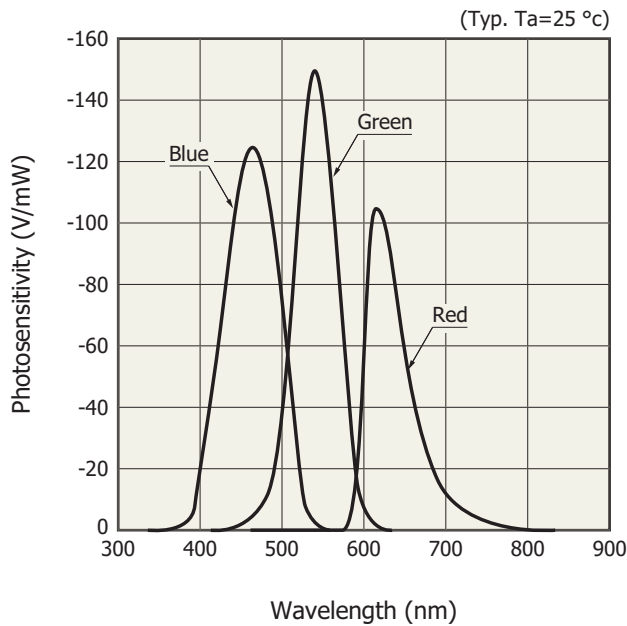
Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

**Electrical and optical characteristics (Ta=25 °C, Vcc=5.0 V, VREF=3.000 V, unless otherwise noted: per 1 ch)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectral response range	$\lambda$	Red	-	590 to 720	-	nm
		Green	-	480 to 600	-	
		Blue	-	400 to 540	-	
Peak sensitivity wavelength	$\lambda_p$	Red	-	620	-	nm
		Green	-	540	-	
		Blue	-	460	-	
Photosensitivity	SR	$\lambda_p=620$ nm	-74	-108	-	V/mW
	SG	$\lambda_p=540$ nm	-122	-156	-	
	SB	$\lambda_p=460$ nm	-88	-122	-	
Trans-impedance	ZtR	Red	-	680	-	k $\Omega$
	ZtG	Green	-	680	-	
	ZtB	Blue	-	680	-	
Output offset voltage	Vos	Dark state	VREF - 5	-	VREF + 5	mV
Output voltage range	Vout		0.4	-	Vos	V
Output signal polarity*2	Vout		Negative			-
Output noise voltage swing	Vn	Dark state, within frequency bandwidth	-	5	-	mVp-p
Rise time	tr	10 to 90%	-	150	-	$\mu$ s
Cutoff frequency	fc	-3 dB	-	2.4	-	kHz
Current consumption	Icc	Dark state	-	0.4	1.5	mA
Operating supply voltage range	Vcc		+2.7	+5	+5.5	V

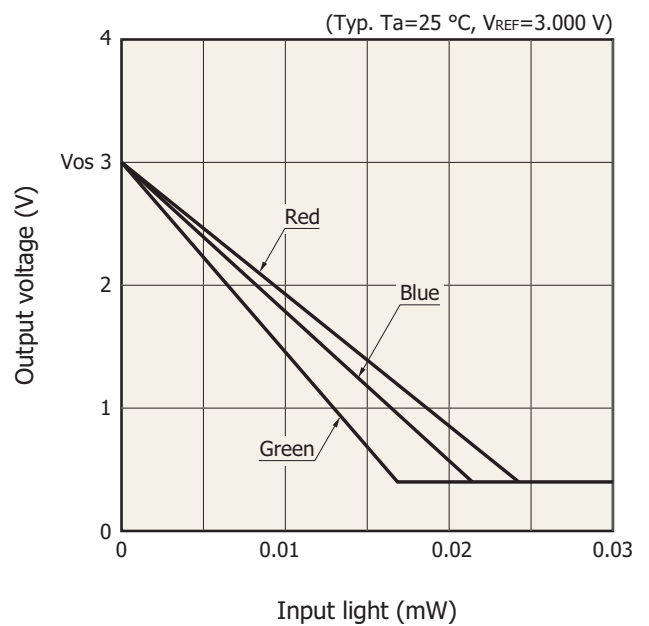
\*2: See the following graph (Output voltage vs. input light).

**Spectral response**



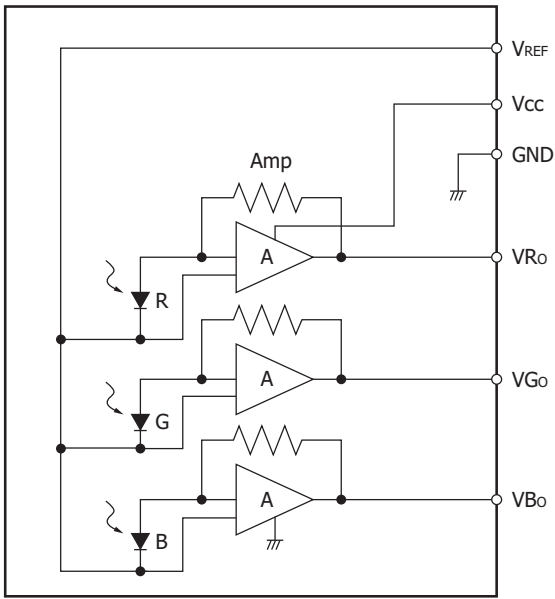
KACCB0123EA

**Output voltage vs. input light**



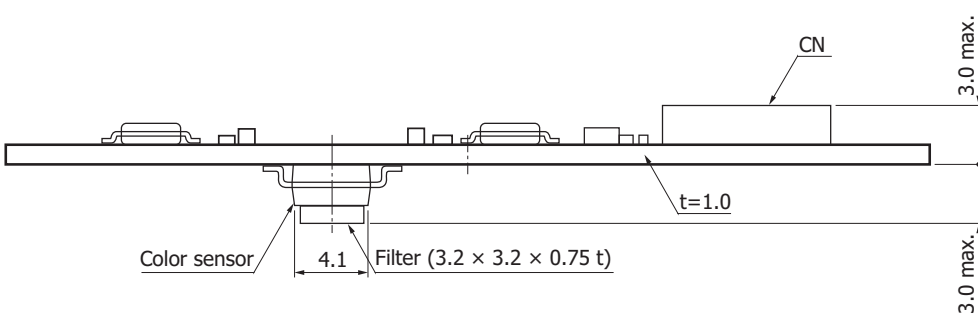
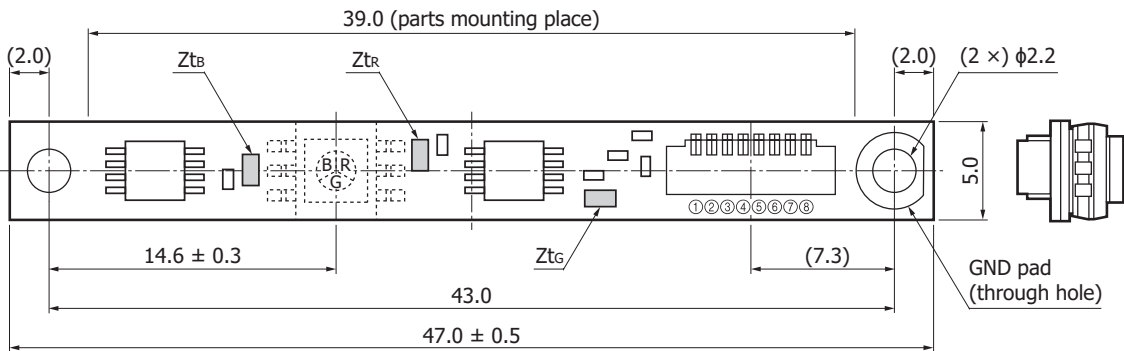
KACCB0124EA

**Block diagram**



KACCC0199EA

**Dimensional outline (unit: mm)**



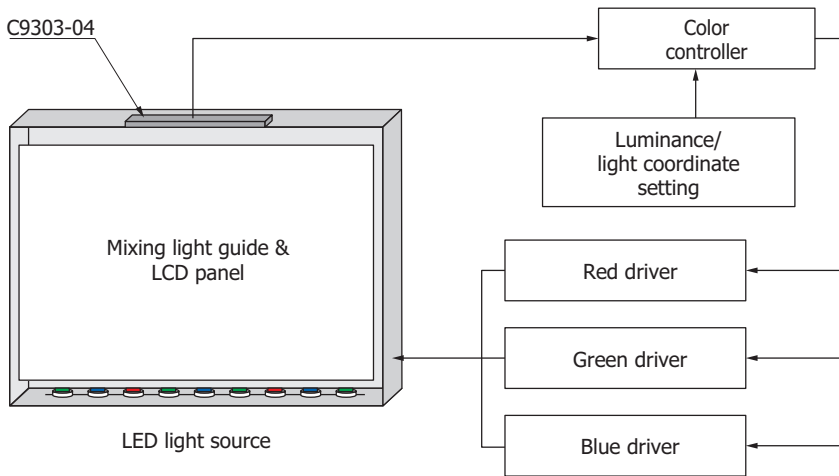
Connector: CN SM08B-SURS-TF (JST)  
 Mating cable: AWG#32  
 Tolerance unless otherwise noted: ±0.2

Pin no.	Signal
①	V <sub>REF</sub>
②	V <sub>cc</sub>
③	GND
④	NC
⑤	V <sub>Go</sub>
⑥	V <sub>Ro</sub>
⑦	V <sub>Bo</sub>
⑧	NC

KACCA0160EA

## Application example

### Optical feedback of backlight for TFT-LCD



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

KACCC0289EA

## Accessories

- Instruction manual
- Dedicated cable with connector (500 ± 50 mm)

## Related information

[www.hamamatsu.com/sp/ssd/doc\\_en.html](http://www.hamamatsu.com/sp/ssd/doc_en.html)

## Precautions

- Disclaimer

Information described in this material is current as of June, 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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