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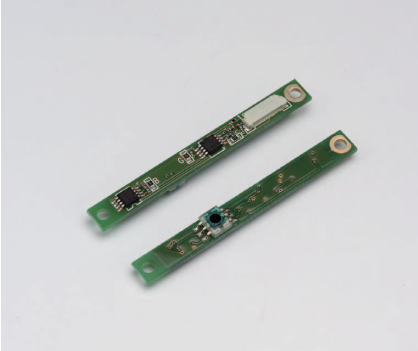
Color sensor module



C9303-03

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

The C9303-03 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**
- **Same gain and pin assignment to the conventional type C9303**
- **Low current consumption: 1/3 than the conventional type**

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

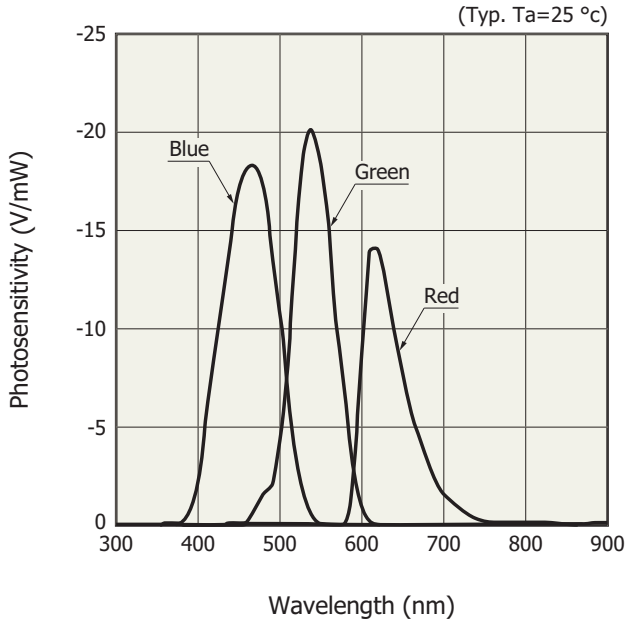
*1: No dew condensation
When there is a temperature difference between a product and the surrounding area in high humidityenvironment,dewcondensation may occur on the product surface. Dew condensation on the product may cause deterioration in characteristics and reliability.
Note: Exceeding the absolute 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, V_{REF}=3.000 V, per 1 ch unless otherwise noted)

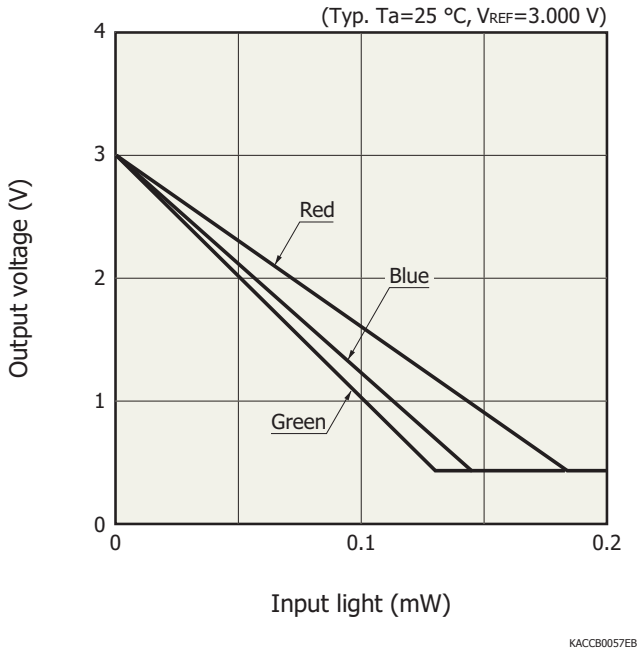
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Spectal response range	λ	Red	-	590 to 720	-	nm
		Green	-	480 to 600	-	
		Blue	-	400 to 540	-	
Peak sensitivity wavelength	λp	Red	-	620		nm
		Green	-	540	-	
		Blue	-	460	-	
Photosensitivity	S_R	λp=620 nm	-10	-14	-	V/mW
	S_G	λp=540 nm	-16	-20	-	
	S_B	λp=460 nm	-13	-18	-	
Trans-impedance	Zt_R	Red	-	91	-	kΩ
	Zt_G	Green	-	91	-	
	Zt_B	Blue	-	100	-	
Output offset voltage	Vos	Dark state	V_{REF} - 5	-	V_{REF} + 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%	-	22	-	µs
Cutoff frequency	fc	-3 dB	-	16	-	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).

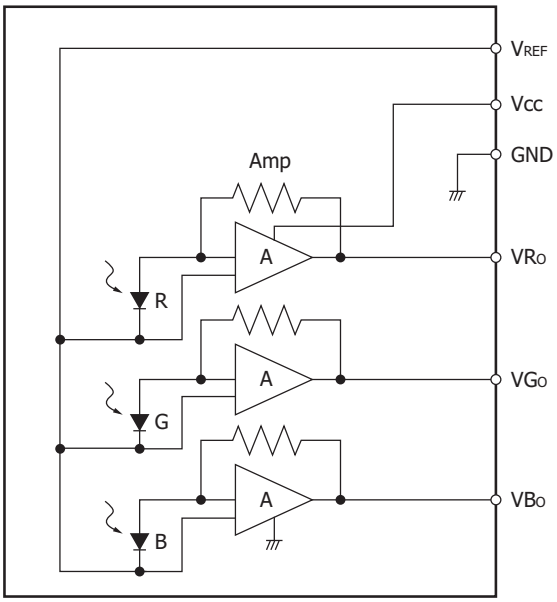
Spectral response



Output voltage vs. input light

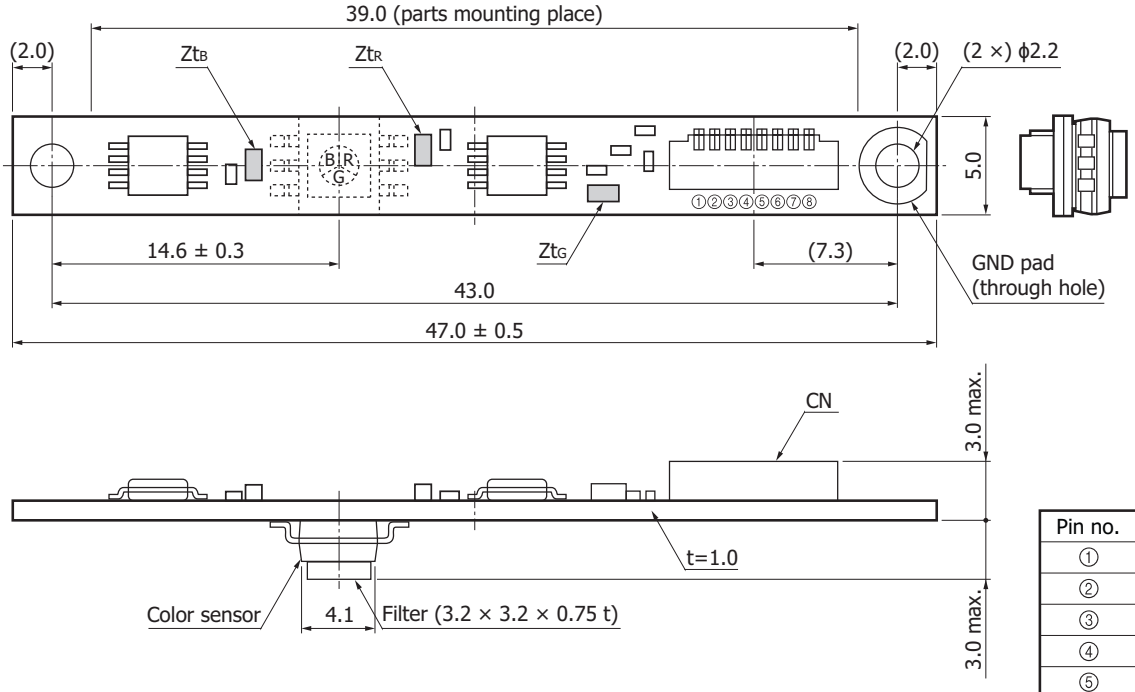


Block diagram



KACCC0199EA

Dimensional outline (unit: mm)

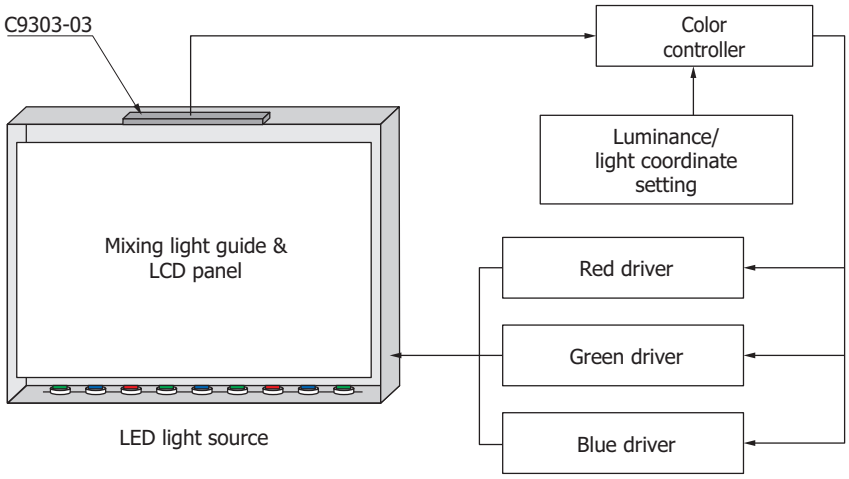


Pin no.	Signal
①	VREF
②	Vcc
③	GND
④	NC
⑤	VGo
⑥	VRo
⑦	VBo
⑧	NC

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

KACCA0160EA

Application example
Optical feedback of backlight for TFT-LCD



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

KACCC0212EC

Accessories

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

Related information

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

■ Precautions
· Disclaimer

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