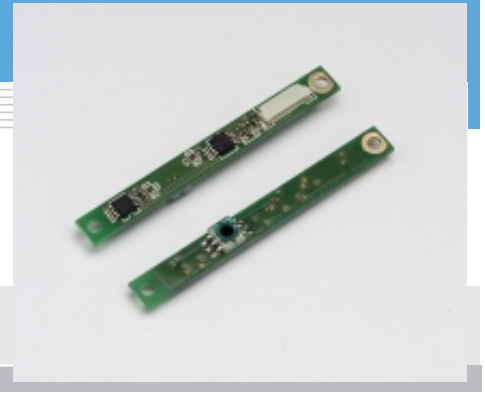


Color sensor module

C9303-04

RGB-LED backlight monitor for TFT-LCD (Liquid Crystal Display)



Recently, RGB-LEDs have been in the focus of attention as the backlight for TFT-LCD (liquid crystal display) since LEDs are mercury-free unlike conventional cold cathode fluorescent lamps. Hamamatsu C9303-04 color sensor module has been specifically developed for the power monitor of RGB-LEDs. We welcome requests for custom shapes and RGB gain. Feel free to contact our sales office.

Features

- Built-in RGB color sensor
Sensitivity matches wavelengths of RGB-LED backlight for TFT-LCD.
- 3 ch current-to-voltage 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)

| 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 |

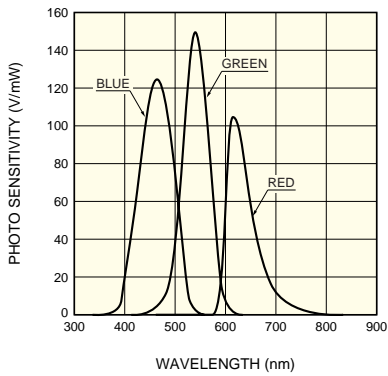
*1: No condensation

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

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|-------------|--|----------|------------|--------|------------|
| Spectral response range | λ | Red | - | 590 to 720 | - | nm |
| | | Green | - | 480 to 600 | - | |
| | | Blue | - | 400 to 540 | - | |
| Peak sensitivity wavelength | λ_p | Red | - | 620 | - | nm |
| | | Green | - | 540 | - | |
| | | Blue | - | 460 | - | |
| Photo sensitivity | 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 Ω |
| | 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 | - | μ s |
| Cut-off 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 |

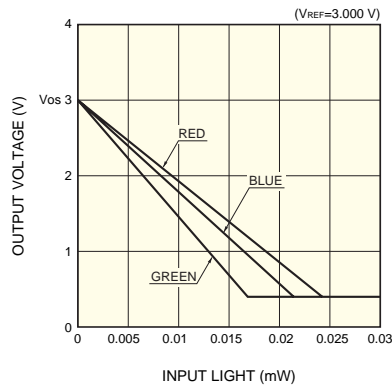
*2: See next page graph (■ Output voltage vs. input light).

■ Spectral response



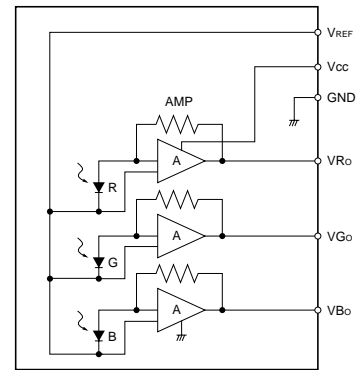
KACCB0123EA

■ Output voltage vs. input light



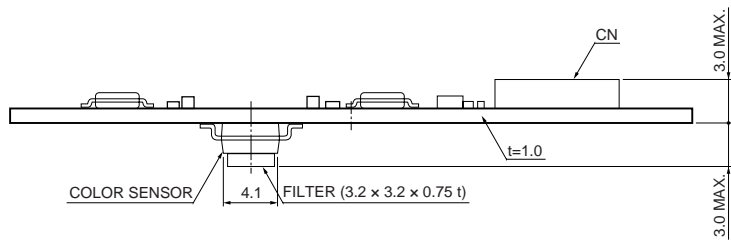
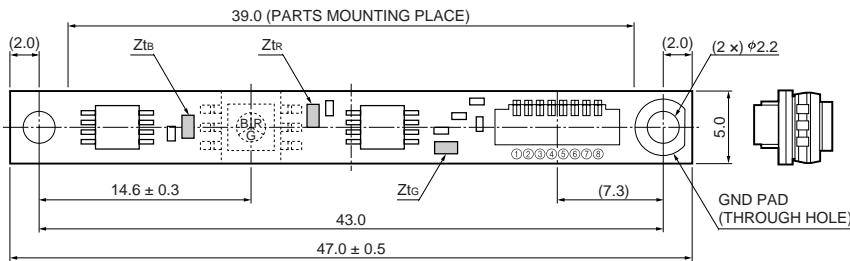
KACCB0124EA

■ Block diagram



KACCC0199EA

■ Dimensional outline (unit: mm)



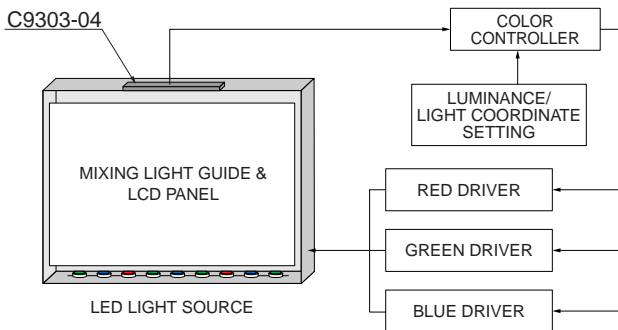
Connector: CN SM08B-SURS-TF (JST)
Mating cable: AWG#32
Tolerance unless otherwise noted: ±0.2

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

KACCA0160EA

■ Application example

Optical feedback of backlight for TFT-LCD



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

KACCC0289EA

■ Accessory

Dedicated cable with connector

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