The S10942-01CT is a color sensor molded into a plastic package having a 3-channel (RGB) photodiode sensitive to the Red (λ=590 nm Min.), Green (λ=480 to 600 nm) and Blue (λ=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.

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### Features
- Small, thin package: 3.0 × 1.6 × 10 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage</td>
<td>VR max</td>
<td>10</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Topr</td>
<td>-25 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
</tbody>
</table>

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, per element )

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral response range</td>
<td>λ</td>
<td>Blue (λ=460 nm)</td>
<td>-</td>
<td>0.16</td>
<td>0.21</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green (λ=540 nm)</td>
<td>-</td>
<td>0.20</td>
<td>0.25</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red (λ=640 nm)</td>
<td>-</td>
<td>0.40</td>
<td>0.45</td>
<td>0.50</td>
</tr>
<tr>
<td>Photosensitivity</td>
<td>S</td>
<td>Blue (λ=460 nm)</td>
<td>-</td>
<td>400 to 540</td>
<td>800 to 1000</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green (λ=540 nm)</td>
<td>-</td>
<td>480 to 600</td>
<td>760 to 1000</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Red (λ=640 nm)</td>
<td>-</td>
<td>590 to 1000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dark current</td>
<td>Id</td>
<td>VR=0 V, RL=1 kΩ</td>
<td>-</td>
<td>1</td>
<td>50</td>
<td>pA</td>
</tr>
<tr>
<td>Temperature coefficient of Id</td>
<td>Tcid</td>
<td>VR=0 V, All elements</td>
<td>-</td>
<td>1.12</td>
<td>-</td>
<td>times/°C</td>
</tr>
<tr>
<td>Rise time</td>
<td>tr</td>
<td>VR=0 V, RL=1 kΩ, 10 to 90%</td>
<td>-</td>
<td>0.1</td>
<td>1.0</td>
<td>μs</td>
</tr>
<tr>
<td>Terminal capacitance</td>
<td>Ct</td>
<td>VR=0 V, f=10 kHz</td>
<td>5</td>
<td>12</td>
<td>25</td>
<td>pF</td>
</tr>
</tbody>
</table>

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Since this photodiode has sensitivity in the infrared region, infrared light must be filtered out as needed.
- **Dimensional outline (unit: mm)**

![Dimensional outline](image)

- **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.

![Temperature profile](image)
**Lineup of RGB color sensors**

<table>
<thead>
<tr>
<th>Type no.</th>
<th>Type</th>
<th>Photosensitive area (mm)</th>
<th>Package (mm)</th>
<th>Peak sensitivity wavelength (nm)</th>
<th>Photosensitivity</th>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>S9032-02</td>
<td>Photodiode</td>
<td>4 × 4.8 × 1.8 × 6 pin (filter 0.75’s)</td>
<td>B 460 B</td>
<td>B 0.18 (A/W) [λ=460 nm]</td>
<td>G 0.23 (A/W) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 540 G</td>
<td></td>
<td>R 0.16 (A/W) [λ=620 nm]</td>
<td></td>
</tr>
<tr>
<td>S9702</td>
<td>Photodiode</td>
<td>3 × 4 × 1.3 × 4 pin (filter 0.75’s)</td>
<td>B 460 B</td>
<td>B 0.18 (A/W) [λ=460 nm]</td>
<td>G 0.23 (A/W) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 540 G</td>
<td></td>
<td>R 0.16 (A/W) [λ=620 nm]</td>
<td></td>
</tr>
<tr>
<td>S10917-35GT</td>
<td>Photodiode</td>
<td>3 × 1.6 × 1.0 COB (on-chip filter)</td>
<td>B 460 B</td>
<td>B 0.2 (A/W) [λ=460 nm]</td>
<td>G 0.23 (A/W) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 540 G</td>
<td></td>
<td>R 0.17 (A/W) [λ=620 nm]</td>
<td></td>
</tr>
<tr>
<td>S10942-01CT</td>
<td>Photodiode</td>
<td>3 × 1.6 × 1.0 COB (on-chip filter)</td>
<td>* B</td>
<td>B 0.21 (A/W) [λ=460 nm]</td>
<td>G 0.25 (A/W) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* G</td>
<td></td>
<td>R 0.45 (A/W) [λ=640 nm]</td>
<td></td>
</tr>
<tr>
<td>S9706</td>
<td>Digital photo IC</td>
<td>4 × 4.8 × 1.8 × 6 pin (filter 0.75’s)</td>
<td>B 465 B</td>
<td>B 0.21 (LSB/lx) [λ=460 nm]</td>
<td>G 0.45 (LSB/ix) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 540 G</td>
<td></td>
<td>R 0.64 (LSB/ix) [λ=620 nm]</td>
<td></td>
</tr>
<tr>
<td>S11012-01CR</td>
<td>Digital photo IC</td>
<td>3.43 × 3.8 × 1.6 COB (on-chip filter)</td>
<td>* Low</td>
<td>* Low</td>
<td>* Low</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B 465 B</td>
<td>B 0.3 (LSB/ix) [λ=460 nm]</td>
<td>G 0.6 (LSB/ix) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 540 G</td>
<td></td>
<td>R 1.4 (LSB/ix) [λ=620 nm]</td>
<td></td>
</tr>
<tr>
<td>S11059-02DT</td>
<td>Digital photo IC</td>
<td>3 × 4.2 × 1 x.3 × 10 pin (on-chip filter)</td>
<td>* Low</td>
<td>* Low</td>
<td>* Low</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B 460 B</td>
<td>B 4.4 (count/ix) [λ=460 nm]</td>
<td>G 8.3 (count/ix) [λ=540 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G 530 G</td>
<td></td>
<td>R 11.2 (count/ix) [λ=620 nm]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R 615 IR</td>
<td></td>
<td>R 3.0 (count/ix) [λ=850 nm]</td>
<td></td>
</tr>
</tbody>
</table>

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

**Related information**


**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.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use.

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