High Performance Trilinear Color CMOS Imaging Sensor

The IT-L7-04096 trilinear sensor is a high performance, digital, RGB line scan CMOS image sensor. The sensor has three individual lines for independent red, blue, and green channels. Each colour has its own exposure control making it easier to perform white calibration. The sensor is optimized for high line rates (3 x 70 kHz) and low noise, while providing high responsivity and high quantum efficiency (QE). The sensor is designed for ease-of-integration and uses FR4 packaging.

The pixel features global shutter capability, 100% fill factor, and true correlated double sampling (CDS) for low noise.

FR4 packaging offers high signal integrity and simple interfacing for quick system integration. The interface consists of two 60-pin connectors, which contain input signals, such as EXSYNC (trigger), clocks and voltages, and output signals, such as data and strobe (s-LVDS). Access to the registers of the sensor is handled through a serial-peripheral interface (SPI), plus the temperature of the sensor can be monitored.

The two 60-pin connectors on the IT-L7 share the same electrical and mechanical interface with the entire IT-K and IT-L sensor series, whereby the two 60-pin connectors and four mounting holes are positioned identically relative to one another as well as having pin compatibility.

Specifications

- **Line Rate**: 70 kHz, maximum
- **Output**: 12-bit digital LVDS
- **Resolution**: 4096 x 3 (4K trilinear)
- **Pixel Size**: 10.56 µm x 10.56 µm
- **Random Noise**: 1.7 DN
- **Dynamic Range**: 67 dB
- **Conversion Gain**: 0.15 DN/e
- **Full Well**: 25 ke
- **Shutter Type**: Global shutter
- **Responsivity**: 270 DN / nJ / cm² @ 12-bit, peak
- **Power Consumption**: 6 W
- **Operating Temperature**: 0° to +60°C
- **Package**: FR4
- **Regulatory Compliance**: RoHS

Models

<table>
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<tr>
<th>Part Number</th>
<th>Resolution</th>
<th>Maximum Line Rates</th>
<th>Pixel Size</th>
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<tr>
<td>IT-L7-04096</td>
<td>4096 x 3</td>
<td>70 kHz</td>
<td>10.56 µm x 10.56 µm</td>
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</table>

Camera part number for sensor evaluation: P4-CC-04K07T
4K Trilinear RGB CMOS Imaging Sensor

- 3 x 16 S
- 3 x 4096 partly pinned photodiode pixels (10.56 µm x 10.56 µm)
- column-wise readout circuits

Notes:
- Savitsky-Golay filtering applied, with 40 nm window and 1st order polynomial.

Responsivity [DN/nJ/cm²]

Wavelength [nm]

Blue Responsivity
Green Responsivity
Red Responsivity