OV10640 HDR product brief

lead free

available in
a lead-free
package

High Definition Video with Enhanced Low-Light Sensitivity and OmniHDR-S Technology for Advanced Automotive Vision Systems

The OV10640 is the automotive industry's first image sensor to utilize backside illumination technology, enabling industry-leading sensitivity. The sensor uses OmniVision's proprietary OmniHDR-S™ technology to deliver high dynamic range (HDR) of up to 120 dB in highly compact automotive-grade packages, making it an excellent solution for a broad range of advanced driver assistance systems (ADAS), including: 360-degree surround view, rear view, machine vision, blind spot detection and lane departure warning.

The sensor's 4.2-micron OmniBSI™ pixel is capable of recording highly detailed full-resolution 1.3-megapixel images and video at 60 frames per second (fps). The OV10640 leverages advanced OmniHDR-S technology

to deliver Split Pixel and Staggered HDR, in which the scene information is sampled simultaneously rather than sequentially. This process minimizes motion artifacts and delivers superior image quality in RAW output in the most demanding and difficult lighting conditions.

The OV10640 contains industry-leading safety mechanisms to fulfill functional safety goals as required by ISO26262. The sensor fits in a 7.4 mm x 7.2 mm aCSP™ package and meets AEC-Q100 Grade 2 qualifications.
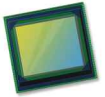
Find out more at www.ovt.com.

Applications

- Automotive
  - 360° surround view system
  - rear view camera
  - lane departure warning/
    lane keep assist
  - blind spot detection
  - rear view video mirror
  - pedestrian detection
  - traffic sign recognition
  - occupant sensor
  - camera monitoring system
  - autonomous driving

OV10640

Ordering Information

- OV10640-N79Y-PE
  (color, lead-free, 78-pin aCSP™)

Product Features

- support for image size:
  - 1280x1080
  - VGA
  - QVGA and any cropped size

- OmniHDR-S™ technology

- high sensitivity

- safety features

- low power consumption

- image sensor processor functions:
  - automatic exposure/gain control
  - lens correction
  - defective pixel cancelation
  - HDR combination and tone mapping
  - automatic black level correction

- supported output formats: RAW

- horizontal and vertical sub-sampling

- serial camera control bus (SCCB)
  for register programming

- high speed serial data transfer with
  MIPI CSI-2, parallel 12-bit DVP output

- external frame synchronization
  capability

- embedded temperature sensor

- one time programmable (OTP) memory

Product Specifications

- **active array size:** 1280 x 1080

- **power supply:**
  - **analog:** 3.14 - 3.47V
  - **digital:** 1.425 - 1.575V
  - **DOVDD:** 1.7 - 1.9V
  - **AVDD:** 1.7 - 1.9V

- **power requirements:**
  - **active:** 360 mW
  - **standby:** 100 µW

- **temperature range:**
  - **operating:** -40°C to +105°C sensor
    ambient temperature

- **output interfaces:** 12-bit DVP,
  MIPI/LVDS CSI-2

- **output formats:**
  - 20-bit combined RAW
  - 12-bit compressed combined RAW
  - separated 12-bit RAW
  - 2x12-bit compressed RAW
  - 16-bit log domain combined RAW
  - 3x12-bit uncompressed RAW

- **lens size:** 1/2.56"

- **lens chief ray angle:** 9°

- **input clock frequency:** 6 - 27 MHz

- **scan mode:** progressive

- **shutter:** rolling shutter

- **maximum image transfer rate:**
  - **full resolution:** 60 fps

- **sensitivity:** 8.4 V/lux-sec

- **max S/N ratio:** 41.5 dB

- **dynamic range:** 120 dB

- **pixel size:** 4.2 µm x 4.2 µm

- **image area:** 5410 µm x 4570 µm

- **package dimensions:**
  - **aCSP:** 7430 µm x 7190 µm

Functional Block Diagram
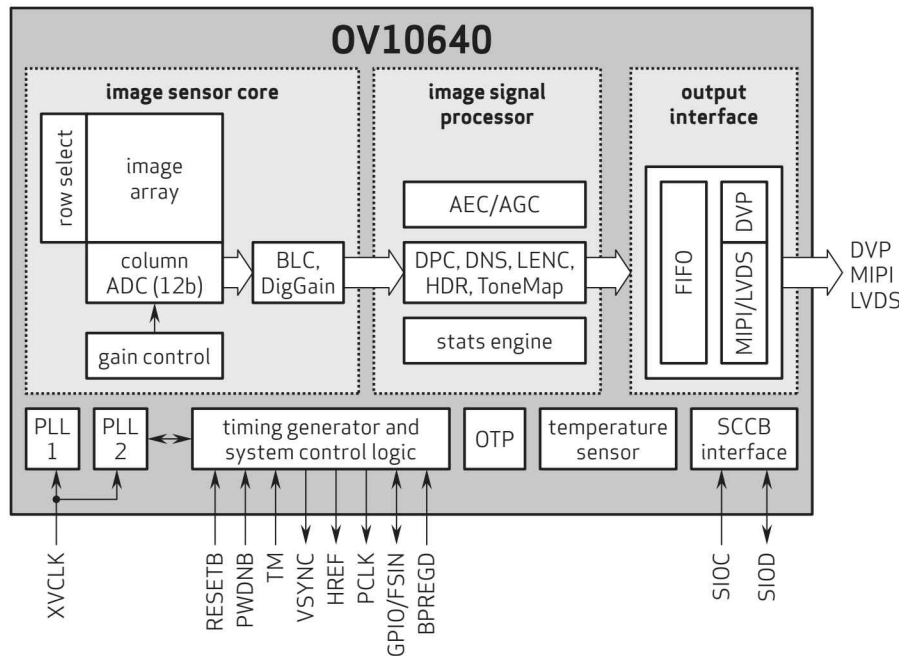
OmniVision®

Version 1.8, September, 2016

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