

OV10630/35 HDR product brief



Megapixel, Color HDR Sensors for Advanced Automotive Display and Sensing Applications



available in
a lead-free
package

The OV10630 and OV10635 system-on-chip (SoC) sensors raise the bar in automotive imaging by combining megapixel resolution with color HDR in a 1/2.7-inch optical format. The AEC-Q100 qualified OV10630 and OV10635 come with a full set of automatic controls and an image processing pipeline for display and sensing applications. Ideally suited for wide field of view and multi-camera applications, the OV10630 and OV10635 also incorporate special features and output formats for automotive machine vision applications. With its proprietary capability to simultaneously deliver high image quality and superior scene information, the OV10630 and OV10635 are designed for automotive applications that perform vision and sensing functions concurrently. The two sensors are similar in functionality and performance but are integrated in different packages, giving customers greater flexibility.

The sensors are built on a 4.2-micron OmniPixel3-HS™ pixel, enabling best-in-class low-light sensitivity of 3.65 V/lux-sec to capture detail-rich, high-definition color video in any environment. Using a proprietary new high dynamic range (HDR) concept and processing technology, these automotive sensors deliver excellent scene reproduction in the most demanding lighting conditions, achieving a dynamic range up to 115 dB in color and black-and-white. The OV10630 and OV10635 not only have the ability to accurately reproduce high-contrast scenes, but also employs auto dynamic range control to adjust to changing lighting and scene conditions to

produce a clear, detailed and low-noise color image in any automotive situation. A proprietary approach to generating HDR images also dramatically reduces or eliminates many typical HDR image sensor artifacts such as motion ghost artifacts and other unwanted effects.

The OV10630 and OV10635 offer all required automatic image control functions, including automatic exposure control, automatic white balance, automatic black level calibration, as well as defective pixel correction, gamma correction and lens shading correction. The sensors support a digital video parallel port, and provide full-framed or windowed 10- or 8-bit YUV and 10- to 18-bit combined HDR RAW output format with complete user control over formatting and output data transfer.

Camera functions are programmable through the serial camera control bus (SCCB) interface. Additional features include a horizontal and vertical windowing capability, external frame sync capability, 50/60 Hz flicker cancellation and low power consumption.

The OV10630 comes in an 11 mm x 11 mm CBGA2 package, while the OV10635 is integrated in a 7.8 mm x 7.1 mm aCSP package.

Find out more at www.ovt.com.

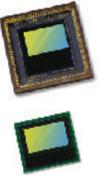
Applications

- Automotive
 - 360° surround view
 - automotive machine vision
 - lane departure warning
 - traffic sign recognition
 - automatic high beam control
 - object detection
- pedestrian detection
- rear view camera
- blind spot detection
- mirror replacement
- occupant sensor
- night vision

Product Features

- support for image sizes:
 - WXGA (1280x800)
 - HD 720p (1280x720)
 - WVGA (752x480)
 - VGA (640x480)
 - 600x400
 - CIF (352x288)
 - QVGA (320x240)
- horizontal and vertical windowing capability
- auto white balance control
- aperture/gamma correction
- serial camera control bus (SCCB) for register programming
- low power consumption
- external frame sync capability
- 50/60 Hz flicker cancellation
- defective pixel correction
- safety features, e.g. temperature sensor, frame embedded register information, etc.
- on-chip image and HDR processing functionality to provide fully processed and rendered HDR video output
- support for output formats: YUV and separated and combined RAW
- parallel DVP interface
- high sensitivity
- automatic exposure/gain

OV10630/35



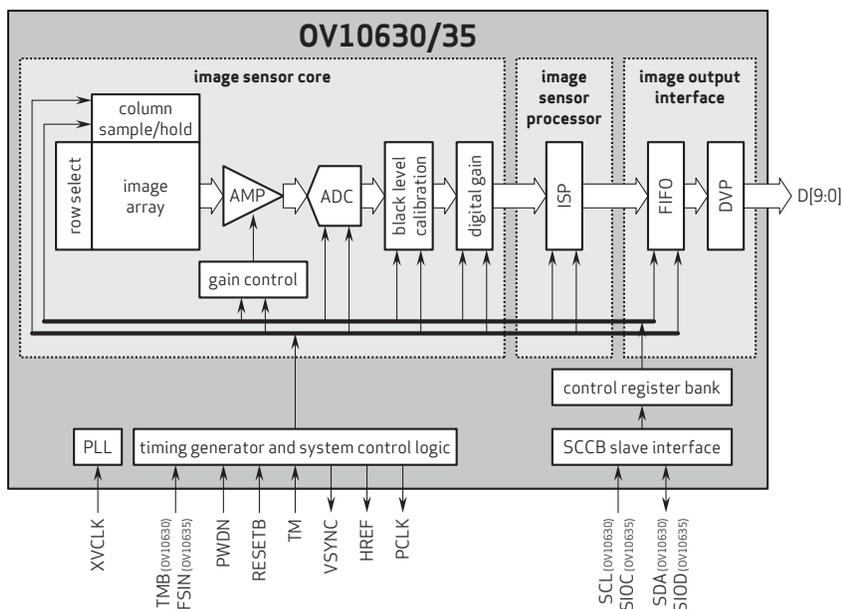
Ordering Information

- OV10630-B96Y**
(color, lead-free, 96-pin CBGA2)
- OV10635-N29Y**
(color, lead-free, 129-pin aCSP™)
- OV10131-B96Y**
(b&w, lead-free, 96-pin CBGA2)
- OV10135-N29Y**
(b&w, lead-free, 129-pin aCSP™)

Product Specifications

- active array size:** 1280 x 800
- lens chief ray angle:** 9°
- power supply:**
 - analog: 3.14-3.47V
 - core: 1.425-1.575V
 - I/O: 1.7-3.6V
- input clock frequency:** 6 - 27 MHz
- power requirements (OV10630):**
 - active: 532 mW typical @ 3.3V AVDD, 1.65V DVDD, and 1.8V DOVDD
 - standby: 480 μW typical @ 3.3V AVDD, 1.65V DVDD, and 1.8V DOVDD
- maximum image transfer rate:** 30 fps
- scan mode:** progressive
- shutter:** rolling shutter
- maximum exposure interval:** 838 x t_{row}
- power requirements (OV10635):**
 - active: 507 mW typical @ 3.3V AVDD, 1.5V DVDD, and 1.8V DOVDD
 - standby: 440 μW typical @ 3.3V AVDD, 1.5V DVDD, and 1.8V DOVDD
- maximum image transfer rate:** 30 fps full resolution
- sensitivity:** 3650 mV/lux-scc
- max S/N ration:** 39 dB
- temperature range:**
 - operating: -40°C to 105°C junction temperature
- dynamic range:** 115 dB
- output interfaces:** 10-bit parallel DVP
- pixel size:** 4.2 μm x 4.2 μm
- output formats:** up to 18-bit combined raw, separated 10-bit raw, 8-/10-bit YUV422
- dark current:** 2.5 mV/s @ 50°C junction temperature
- image area:** 5510.4 μm x 3418.8 μm
- lens size:** 1/2.7"
- package/die dimensions:**
 - CBGA2: 11 mm x 11 mm
 - aCSP: 7795 μm x 7145 μm

Functional Block Diagram



4275 Burton Drive
Santa Clara, CA 95054
USA

Tel: +1 408 567 3000
Fax: +1 408 567 3001
www.ovt.com

OmniVision reserves the right to make changes to their products or to discontinue any product or service without further notice. OmniVision and VarioPixel are registered trademarks of OmniVision Technologies, Inc. The OmniVision logo and OmniBSI are trademarks of OmniVision Technologies, Inc. All other trademarks are the property of their respective owners.