

# OV9716 1.4MP product brief



available in  
a lead-free  
package

## 1.4-Megapixel Image Sensor with Best-in-Class Performance for Cost-Effective Automotive Applications

OmniVision's OV9716 is a high-performance image sensor that brings 1392 x 976 resolution at up to 60 frames per second with more than 120 dB dynamic range to automotive imaging applications. The sensor comes in a 1/3.8-inch optical format and is built on 2.8-micron OmniBSI-2™ Deep Well™ pixel technology, which delivers best-in-class low-light sensitivity and high dynamic range (HDR) performance even in challenging lighting conditions. The OV9716 is specifically designed to bring the performance of a high-end imaging solution at a cost and form factor suitable for the automotive mass market segment, targeting rear view cameras and 360-degree surround view systems.

The OV9716's Deep Well™ pixel technology provides a 16-bit linear output, capturing 94 dB of scene dynamic range in a single frame, compared to traditional sensors with only 12-bit linear output. This 94 dB output comes

without HDR combination artifacts and has no sudden drops in signal-to-noise ratio across the scene. The sensor can further expand dynamic range to more than 120 dB by using a second 'very short' exposure, also minimizing motion artifacts.

The OV9716 is available in an AEC-Q100 Grade 2-qualified, compact 5.8 x 5.25 mm chip scale package and contains an advanced set of safety mechanisms to enable ISO 26262 ASIL B-rated camera systems. The sensor is compatible with OmniVision's family of powerful image signal processor (ISP) companion chips for display-based automotive applications.

Find out more at [www.ovt.com](http://www.ovt.com).



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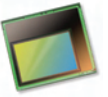
## Applications

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

## Product Features

- support for image size:
  - 1392 x 976
  - VGA
  - QVGA, and any cropped size
- high dynamic range
- high sensitivity
- low power consumption
- image sensor processor functions:
  - lens correction
  - defective pixel cancelation
  - HDR combination
  - automatic black level correction
- supported output formats:
  - RAW
- horizontal and vertical sub-sampling
- 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

# OV9716



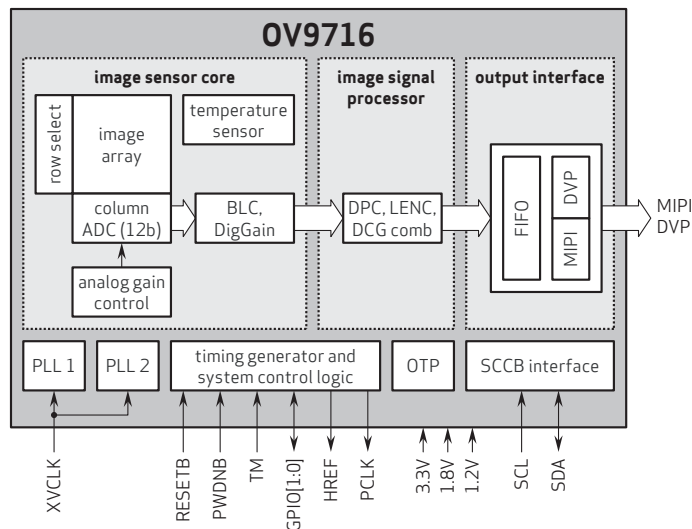
## Ordering Information

- **OV9716-E66Y-1E** (color, lead-free)  
66-pin a-CSP™ in tray
- **OV9716-E66Y-1E** (color, lead-free)  
66-pin a-CSP™ with protective film in tray with protective film (3 mm tab length)
- **OV9716-E66Y-OE** (color, lead-free)  
66-pin a-CSP™ with protective film in tray and reel with protective film (3 mm tab length)
- **OV9716-E66Y-GE** (color, lead-free)  
66-pin a-CSP™ with protective film in tray with protective film (0.5 mm tab length)
- **OV9716-E66Y-KE** (color, lead-free)  
66-pin a-CSP™ with protective film in tray with protective film (0.5 mm tab length)

## Product Specifications

- **active array size:** 1392 x 976
- **power supply:**
  - analog: 3.14 - 3.47V
  - digital: 1.14 - 1.3V
  - DOVDD: 1.7 - 1.9V
  - AVDD: 1.7 - 1.9V
- **power requirements:**
  - active: 350 mW
  - standby: 12.5 mW
- **temperature range:**
  - operating: -40°C to +105°C sensor ambient temperature and -40°C to +125°C junction temperature
- **output interfaces:**  
up to 4-lane MIPI CSI-2, 12-bit DVP
- **input clock frequency:** 6 - 36 MHz
- **lens size:** 1/3.8"
- **lens chief ray angle:** 15°
- **scan mode:** progressive
- **output formats:** single exposure HDR - 16-bit combined RAW, 12-bit compressed combined RAW; dual exposure HDR - 16-bit combined RAW + 12-bit VS RAW, 12-bit compressed combined RAW + 12-bit VS RAW, 3x12 bit RAW, 3x10 bit RAW
- **shutter:** rolling shutter
- **maximum image transfer rate:**  
60 fps full resolution
- **sensitivity:** 27,500 e<sup>-</sup>/Lux.s
- **max S/N ratio:** 42.2 dB
- **dynamic range:** 120 dB
- **pixel size:** 2.8 μm x 2.8 μm
- **image area:** 3942.4 μm x 2777.6 μm
- **package dimensions:**  
5814 μm x 5254 μm

## Functional Block Diagram



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