

# OV8830 8-megapixel product brief



available in  
a lead-free  
package

## High Performance, Ultra Compact 8-Megapixel CMOS Image Sensor Based on OmniBSI-2™ Delivers Low Power HD Mobile Imaging Solution for Next Generation Smart Phones

The OV8830 is OmniVision's first sensor built on the company's second generation OmniBSI-2™ backside illumination (BSI) pixel architecture. It delivers optimized power consumption and best-in-class pixel performance that enable enhanced image capture and high frame rate 1080p and 720p high-definition (HD) video recording. Manufactured combining a copper process on 300 mm wafers using 65 nm design rules, the 1/3.2-inch OV8830 is highly optimized for the next generation smart phone market.

Benefits of OmniBSI-2 technology found in the OV8830 include optimized die size, a bigger collection region in the photodiode enabled by custom design rules, a significant reduction in power consumption, and 1.14 - 1.32V digital core. Key improvements over the first generation OmniBSI architecture include a 20 percent improvement in peak quantum efficiency in all color channels, 35 percent improvement in low-light sensitivity, and 45 percent increase in full well capacity. OmniBSI-2's custom pixel design rules also enable better pixel layout, better isolation, and significantly reduced crosstalk. Each of these advances represent additional performance improvements over the first generation OmniBSI technology resulting in better image quality, enhanced color reproduction, and improved overall camera performance.

In full 8-megapixel (3264 x 2448) resolution, the OV8830 operates at 24 frames per second (fps) in a 4:3 format and in 6-megapixel (3264 x 1836) resolution at 30 fps in a 16:9 format. These higher frame rates enable a number of key benefits, including: no image lag for shutter-less designs, continuous shooting, minimized rolling shutter effect, real-time image capture with no lag between resolutions, and full HD at 30 or 60 fps.

The OV8830 is a RAW sensor designed for 2-chip solutions that involve the sensor working in conjunction with a baseband or an application processor with integrated image signal processing. Additional integrated features of the OV8830 include an integrated scaler, 2x2 binning, re-sampling filter, alternate row high dynamic range timing support, context switching, temperature sensing, 4 Kbits of one-time programmable memory, lens shading correction, and defect pixel correction. The OV8830 fits into the industry standard module size of 8.5 x 8.5 x 6 mm, and a high-speed, 4-lane mobile industry processor interface (MIPI) facilitates the required high data transfer rate.

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



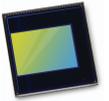
## Applications

- Cellular and Mobile Phones
- Digital Video Camcorders (DVC)
- Digital Still Cameras (DSC)
- PC Multimedia

## Product Features

- 1.4  $\mu\text{m}$  OmniBSI-2™ technology
- supports horizontal and vertical subsampling
- 2/4-lane MIPI serial output interface
- supports images sizes: 8MP, 6MP, EIS1080p, 1080p, EIS720p, EISQ 1080p, Q1080p, EISVGA, VGA, QVGA, etc.
- support scalar, 2x2 binning, re-sampling filter
- standard serial SCCB interface
- supports alternate row HDR timing
- two on-chip phase lock loop (PLL)
- embedded 4K bits one-time programmable (OTP) memory
- programmable I/O drive capability
- context switching
- built-in 1.2V regulator for core
- image quality controls: 2D-DPC and lens shading correction
- built-in temperature sensor
- automatic black level calibration (ABLC)
- programmable controls for frame rate, mirror and flip, cropping, windowing, and scaling

# OV8830



## Ordering Information

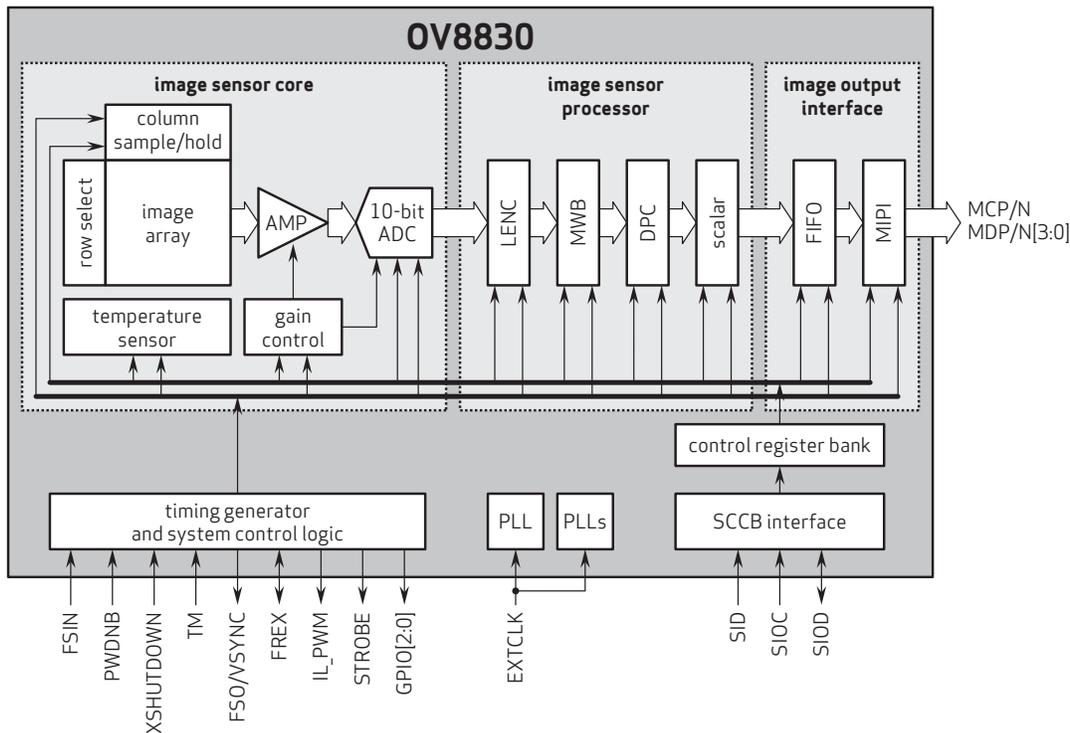
- OV08830-G04A**  
(color, chip probing, 200  $\mu\text{m}$  backgrinding, reconstructed wafer with good die)
- OV08830-G20A**  
(color, chip probing, no backgrinding, no die-saw, whole wafer)

## Product Specifications

- lens size:** 1/3.2"
- active array size:** 3264 x 2448
- output formats:** 10-bit RAW RGB
- lens chief ray angle:** 27° non-linear
- standard module size:** 8.5 x 8.5 x 6 mm
- temperature range:**
  - operating: -30°C to 85°C junction temperature
  - stable image: 0°C to 60°C junction temperature
- maximum image transfer rate:**
  - 8MP: 24 fps
  - EIS1080p: 30 fps
  - EIS720p: 60 fps
- input clock frequency:** 6 - 27 MHz
- power supply:**
  - core: 1.14 - 1.32V for up to 700 Mbps/lane or 1.27 - 1.32V for up to 1 Gbps/lane MIPI (internal regulator optional)
  - analog: 2.6 - 3.0V
  - I/O: 1.7 - 3.0V
- sensitivity:** 824 mV/lux-sec\*\*
- scan mode:** progressive
- pixel size:** 1.4  $\mu\text{m}$  x 1.4  $\mu\text{m}$
- image area:** 4592  $\mu\text{m}$  x 3450  $\mu\text{m}$
- power requirements:**
  - active: 155 mA (291 mW\*)
  - standby: 300  $\mu\text{A}$
  - XSHUTDOWN: 10  $\mu\text{A}$
- die dimensions:** 6410  $\mu\text{m}$  x 5940  $\mu\text{m}$

\* If the internal regulator is used, a higher power consumption of 339 mW with DOVDD = 1.8V is achieved.  
\*\* Pixel performance shown is a target value. This value is subject to change based on real measurements.

## 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, the OmniVision logo and OmniPixel are registered trademarks of OmniVision Technologies, Inc. OmniBSI-2 is a trademark of OmniVision Technologies, Inc. All other trademarks are the property of their respective owners.

**OmniVision**