

OV8830 8-megapixel product brief



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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.



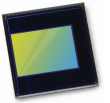
Applications

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

Product Features

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

OV8830



Ordering Information

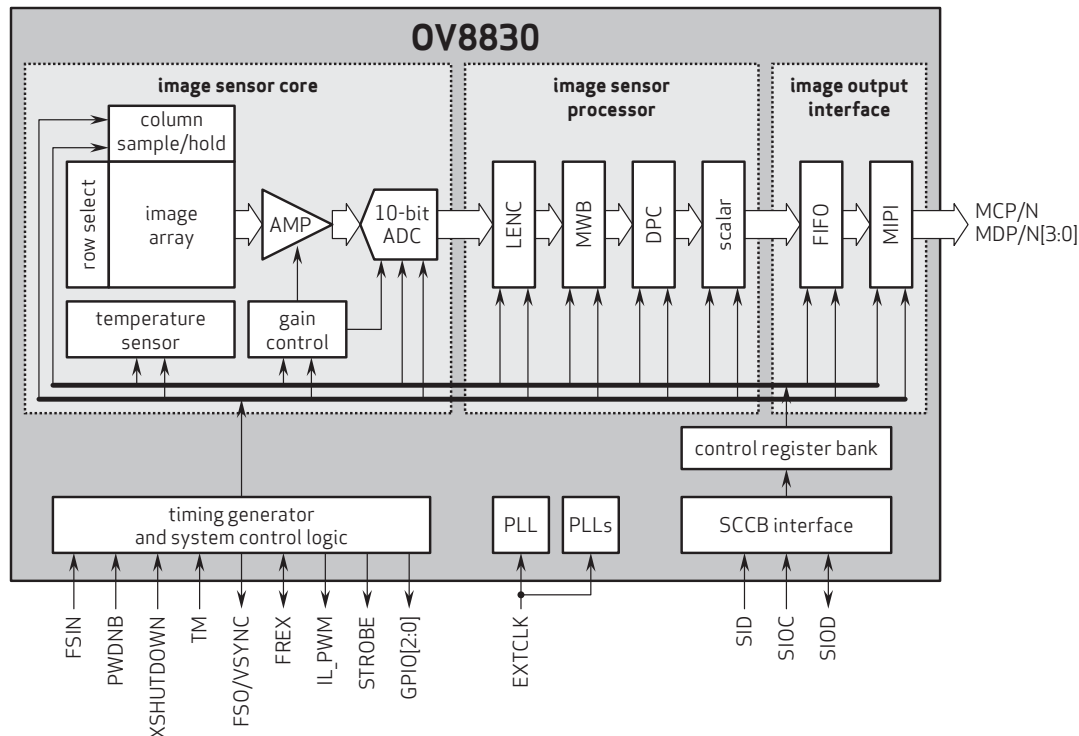
- **OV8830-G04A**
(color, chip probing, 200 μm backgrinding, reconstructed wafer with good die)
- **OV8830-G20A**
(color, chip probing, no backgrinding, no die-saw, whole wafer)

Product Specifications

- **lens size:** 1/3.2"
- **output formats:** 10-bit RAW RGB
- **standard module size:** 8.5 x 8.5 x 6 mm
- **maximum image transfer rate:**
 - 8MP: 24 fps
 - EIS1080p: 30 fps
 - EIS720p: 60 fps
- **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
- **power requirements:**
 - active: 155 mA (291 mW*)
 - standby: 300 μA
 - XSHUTDOWN: 10 μA
- **active array size:** 3264 x 2448
- **lens chief ray angle:** 27° non-linear
- **temperature range:**
 - operating: -30°C to 85°C junction temperature
 - stable image: 0°C to 60°C junction temperature
- **input clock frequency:** 6 - 27 MHz
- **sensitivity:** 824 mV/lux-sec**
- **scan mode:** progressive
- **pixel size:** 1.4 μm x 1.4 μm
- **image area:** 4592 μm x 3450 μm
- **die dimensions:** 6410 μm x 5940 μm

* 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



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OmniVision