OV8820 8-megapixel product brief

High-Performance, Feature Rich 8-Megapixel RAW CMOS Image Sensor for Fast Growing Smart Phone Market

lead free

available in a lead-free package

Based on OmniVision's proven 1.4-micron OmniBSI™ pixel architecture, the 1/3.2-inch, 8-megapixel OV8820 delivers high frame rate 1080p/30 and 720p/60 high-definition (HD) video with electronic image stabilization (EIS) and full horizontal field of view (FOV), designed specifically to meet the demands of the rapidly growing feature and smart phone markets. The sensor's advanced backside illumination pixel architecture delivers excellent low-light performance, crosstalk and quantum efficiency for the next generation of high performance, high resolution phones. The feature rich OV8820 also offers advanced video capabilities that support mobile YouTube and Facebook applications, making it an ideal solution for tomorrow's video-centric camera phones.

The OV8820 operates at high frame rates, offering full 8-megapixel resolution (4:3) at 24 frames per second (fps), and 6-megapixel resolution (16:9) at 30 fps. Moreover, its high frame rates also support 720p HD video at 60 fps and 1080p HD at 30 fps with EIS. The integrated scalar enables the

OV8820 to maintain full FOV and an improved signal-to-noise ratio in 1080p mode. A high-speed, 4-lane MIPI interface provides the necessary high data transfer rate. Other key image processing features include 2 X 2 binning functionality with a post-binning re-sampling filter function that minimizes spatial artifacts and removes image artifacts around edges to deliver clean, crisp color images, critical for achieving best-in-class 720p video.

A RAW sensor, the OV8820 is designed for 2-chip solutions, combining the sensor and a baseband or application processor with integrated image signal processing. It has an on-chip VCM driver and fast mode switching between different resolutions. The low power OV8820 also features a temperature sensor, 256-byte one-time programmable memory, lens shading correction and defect pixel correction.

Find out more at www.ovt.com.

OmniVision.

Applications

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

OV8820

Product Features

- pixel: 1.4 µm OmniBSI™ technology
  - backside illumination
  - high sensitivity
  - high quantum efficiency
  - reduced crosstalk

- scalar

- image quality controls: lens correction and defective pixel canceling

- support for output formats:
  10-bit RAW RGB (MIPI)

- support for horizontal and vertical subsampling

- support for images sizes: 8 Mpixel, EIS1080p, 1080p, EIS720p, EISQ 1080p, Q1080p, EISVGA, VGA, QVGA, etc.

- VCM driver on-chip

- support 2x2 binning, re-sampling filter

- standard serial SCCB interface

- 2/4-lane high speed MIPI interface

- embedded one-time programmable (OTP) memory for part identification, etc.: 2 Kbits

- on-chip phase lock loop (PLL)

- programmable I/O drive capability

- built-in 1.5 V regulator for core
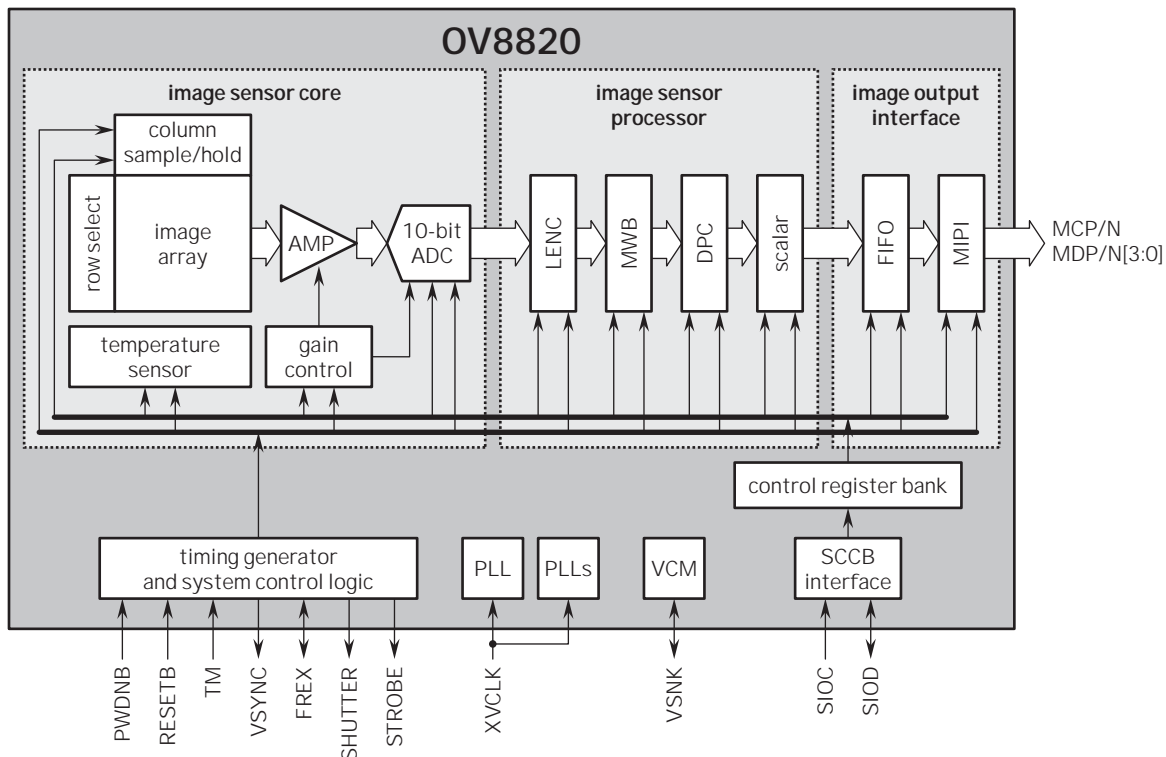
- standard module size:
  8.5 x 8.5 x 6 mm
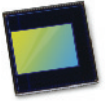
Product Specifications

- active array size: 3296 x 2460

- power supply:
  - core: 1.5 VDC ±5% (internal regulator optional)
  - analog: 2.6 - 3.0 V
  - I/O: 1.7 ~ 3.0 V

- power requirements:
  - active: 170 mA (419 mW)
  - standby: 30 µA

- temperature range:
  - operating: -30°C to 70°C
  - stable image: 0°C to 50°C

- output formats: 10-bit raw RGB data

- lens size: 1/3.2"

- lens chief ray angle: 27° non-linear

- input clock frequency: 6 - 27 MHz

- max S/N ratio: 35 dB

- dynamic range: 68 dB @ 8x gain

- maximum image transfer rate:
  - 8 Mpixel: 24 fps
  - EIS1080p: 30 fps
  - EIS720p: 60 fps

- sensitivity: 600 mV/lux-sec

- scan mode: progressive

- maximum exposure interval:
  2480 x t_{ROW}

- pixel size: 1.4 µm x 1.4 µm

- dark current: 8 mV/sec @ 60°C junction temperature

- image area: 4614 µm x 3444 µm

- die dimensions: 6350 µm x 6750 µm

Functional Block Diagram