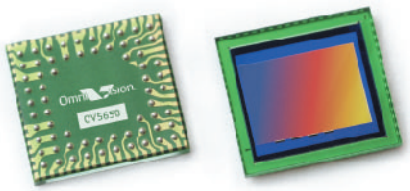


OV5650 5-megapixel product brief

DSC-Quality Imaging for High-Performance Mobile Phones

lead free

available in a lead-free package

The OV5650 is OmniVision's advanced 5-megapixel imaging solution for mobile phones featuring 1.75 µm OmniBSI™ (backside illumination) technology. OmniBSI technology delivers a number of performance improvements over front-side illumination (FSI) technology, including increased sensitivity per unit area, improved quantum efficiency, reduced crosstalk and photo response non-uniformity, which all lead to significant improvements in image quality.

Designed specifically to address consumer demand for digital still camera (DSC) quality imaging in a mobile phone, the OV5650 combines industry leading low-light sensitivity at 1300 mV/lux-sec and a 2x improvement in (SNR10) signal-to-noise ratio (<60 lux), with the industry's lowest stack height – ideal for today's ultra-slim mobile phones.

The superior pixel performance of the 1/3.2-inch OV5650 enables high frame rate 720p HD video at 60 frames per second with complete user control over formatting and output data transfer. The OV5650 supports a digital video parallel port or two-lane MIPI, provides full-frame, windowed or binned 10-bit images in RAW RGB format, and 256 bytes of available on-chip memory.

Automatic image control features and high frame rates for video encoding deliver vivid still and video images, even in the most challenging lighting conditions.

The OV5650 – an ideal 5-megapixel solution for mobile imaging. Find out more at www.ovt.com.

OmniVision

OV5650

Applications

- Mobile Phones
- Games and Toys
- PC Multimedia
- Digital Still Cameras (DSC)

Product Features

- 1.75 µm x 1.75 µm pixel with OmniBSI technology for high performance (high sensitivity, low crosstalk, low noise)
- automatic image control functions:
  - automatic exposure control (AEC)
  - automatic white balance (AWB)
  - automatic band filter (ABF)
  - automatic 50/60 Hz luminance detection
  - automatic black level calibration (ABLC)
- programmable controls for frame rate, AEC/AGC 16-zone size/position/ weight control, mirror and flip, cropping, windowing, and panning
- image quality controls: lens correction, 2-D defective pixel canceling
- support for output formats: 8/10-bit raw RGB data
- support for video or snapshot operations
- support for LED and flash strobe mode
- support for internal and external frame synchronization for frame exposure mode
- support for horizontal and vertical sub-sampling and 2x2 binning
- standard serial SCCB interface
- digital video port (DVP) parallel output interface
- MIPI interface (two lanes)
- 256 bytes of embedded one-time programmable (OTP) memory
- on-chip phase lock loop (PLL)
- embedded 1.5V regulator for core power
- programmable I/O drive capability, I/O tri-state configurability
- support for black sun cancellation
- suitable for module size of 8.5 x 8.5 x 6 mm

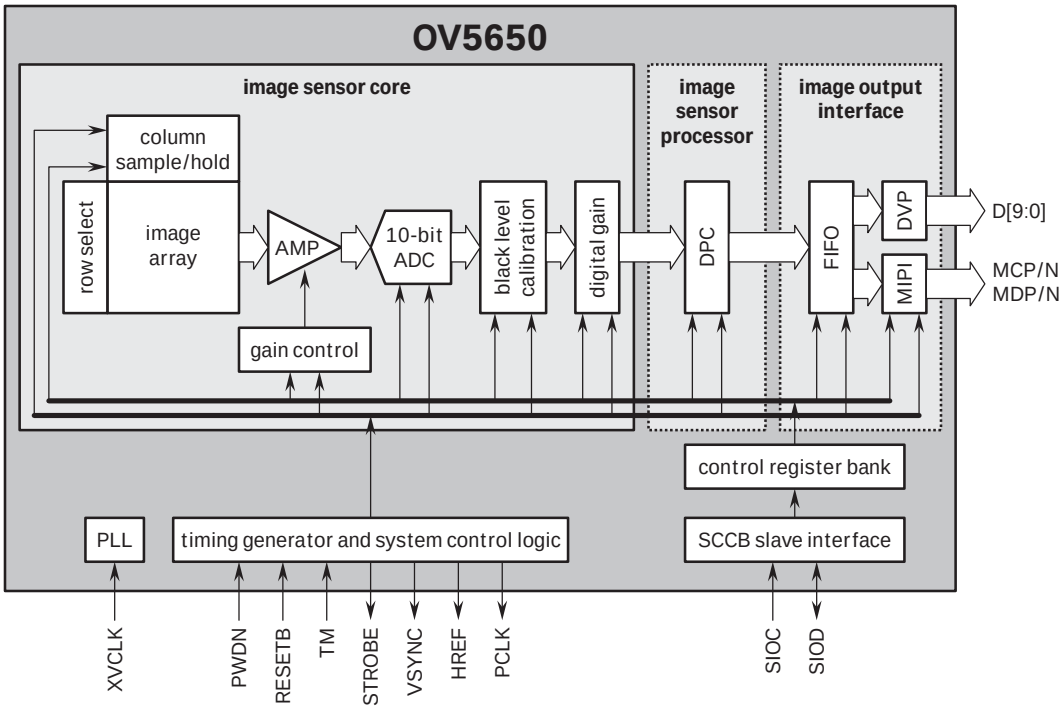
Ordering Information

- OV05650-A66A (color, lead-free, 66-pin CSP3)
- OV05650-G04A (color, chip probing, 200 µm backgrinding, reconstructed wafer)

Product Specifications

- active array size: 2592 x 1944
- power supply:
  - core: 1.5V ±5% (with embedded 1.5V regulator)
  - analog: 2.6 ~ 3.0V (2.8V typical)
  - I/O: 1.8V/2.8V
- power requirements:
  - active: 150 mA
  - standby: 40 µA
- temperature range:
  - operating: -30°C to 85°C junction temperature
  - stable image: 0°C to 65°C junction temperature
- output formats: 8/10-bit raw RGB data
- lens size: 1/3.2"
- lens chief ray angle: 25.1°
- input clock frequency: 6 ~ 27 MHz
- max S/N ratio: 37 dB
- dynamic range: 69 dB @ 8x gain
- maximum image transfer rate:
  - QSXGA (2592 x 1944): 15 fps
  - 1080p: 30 fps
  - 720p: 60 fps
  - VGA (640 x 480): 90 fps
  - QVGA (320 x 240): 120 fps
- sensitivity: 1300 mV/lux-sec
- shutter: rolling shutter
- maximum exposure interval: 1968 x t_{ROW}
- pixel size: 1.75 µm x 1.75 µm
- dark current: 8 mV/s @ 50°C junction temperature
- image area: 4592 µm x 3423 µm
- package/die dimensions:
  - CSP3: 6505 µm x 6005 µm
  - COB: 6500 µm x 6000 µm

Functional Block Diagram



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