# CMOS CAMERA MODULES

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# KLT-Raspberry-Pi-OV5647 V2.0

## OmniVision OV5647 Raspberry Pi Compatible Foco fijo 5MP M12 Módulo de cámara





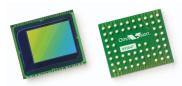
Módulo de cámara No.	KLT-Raspberry-Pi-OV5647 V2.0
Sensor de imagen	OV5647
EFL	1.8 mm
F.NO	2
Pixel	2592 x 1944 (QSXGA)
Ángulo de visión	177°
Tipo de lente	1/4 pulgada
Dimensiones de la lente	13.60 X 13.60 X 16.00 mm
Tamaño del módulo	32.00 x 32.00 mm
Tipo de módulo	Foco fijo
Interfaz	MIPI
Modelo de lente IMT	IMT-7B12E003-N





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# OV5647 5-megapixel product brief

# 5-megapixel 1/4" Image Sensor with 1.4 µm OmniBSI Technology Offering HD Video

The OV5647 is a 5-megapixel CMOS image sensor built on OmniVision's proprietary 1.4-micron OmniBSI<sup>™</sup> backside illumination pixel architecture. The OV5647 delivers 5-megapixel photography in addition to high frame rate of 720p/60 and 1080p/30 high-definition (HD) video capture in an industry standard camera module size of 8.5 x 8.5 x 5 mm, making it an ideal solution for the mainstream mobile phone market.

available in

a lead-free

nackage

The 720p/60 HD video is captured in full field of view (FOV) with 2x2 binning to double the sensitivity and improve signal-to-noise ratio (SNR). The post binning re-sampling filter helps minimize spatial and aliasing artifacts to provide superior image quality.

OmniBSI technology offers significant performance benefits over front-side illumination technology, such as increased sensitivity per unit area, improved quantum efficiency, reduced crosstalk and photo response non-uniformity, which all contribute to significant improvements in image quality and color reproduction. Additionally, OmniVision CMOS image sensors use proprietary sensor technology to improve image quality by reducing or eliminating common lighting/electrical sources of image contamination, such as fixed pattern noise and smearing to produce a clean, fully stable color image.

The low power OV5647 supports a digital video parallel port or high-speed two-lane MIPI interface, and provides fullframe, windowed or binned 10-bit images in RAW RGB format. It offers all required automatic image control functions, including automatic exposure control, automatic white balance, automatic band filter, automatic 50/60 Hz luminance detection, and automatic black level calibration.

Find out more at www.ovt.com.



#### Applications

- Mobile Phones
- PC Multimedia
- Digital Still Cameras

#### **Product Features**

- 1.4 μm x 1.4 μm pixel with OmniBSI technology for high performance (high sensitivity, low crosstalk, low noise)
- optical size of 1/4"
- automatic image control functions: - automatic exposure control (AEC) - automatic white balance (AWB) -automatic band filter (ABF) -automatic 50/60 Hz luminance detection **a** standard serial SCCB interface 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, 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 2x2 binning for better SNR in low light conditions
- post binning resampling filter to minimize spatial/aliasing artifacts on 2x2 binned image
- support for horizontal and vertical sub-sampling
- . digital video port (DVP) parallel output interface
- MIPI interface (two lanes)
- 32 bytes of embedded one-time programmable (OTP) memory
- on-chip phase lock loop (PLL)
- embedded 1.5V regulator for core
- programmable I/O drive capability, I/O tri-state configurability
- support for black sun cancellation

- OV05647-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: 1.7 - 3.0V
- power requirements: - active 96 mA - standby: 20 µA
- temperature range:
  operating: -30°C to 70°C junction temperature stable image: 0°C to 50°C junction
- temperature output formats: 8-/10-bit RGB RAW data
- lens size: 1/4"
- lens chief ray angle: 24°
- input clock frequency: 6 27 MHz

dynamic range: 67 dB @ 8x gain

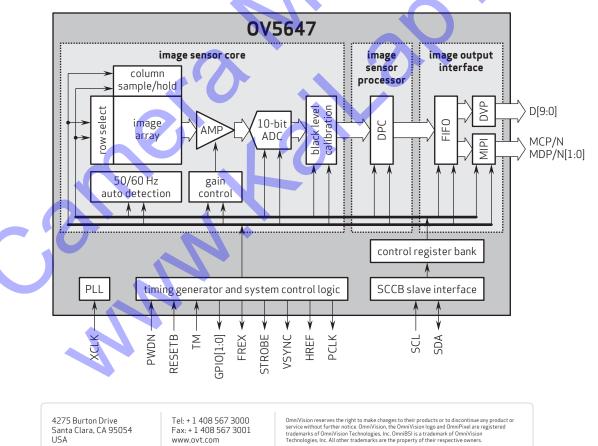
OV5647

- maximum image transfer rate: QSXGA (2592x1944): 15 fps
  - 1080p: 30 fps 960p: 45 fps

max S/N ratio: 34 dB

- 720p: 60 fps VGA (640x480): 90 fps
- sensitivity: 600 mV/lux-sec
- shutter: rolling shutter
- maximum exposure interval: 1968 x t<sub>ROW</sub>
- pixel size: 1.4 μm x 1.4 μm
- dark current: 8 mV/sec @ 50°C junction temperature
- image area: 3673.6 μm x 2738.4 μm
- die dimensions: 5520 µm x 4700 µm

### Functional Block Diagram





Version 1.3, October, 2012