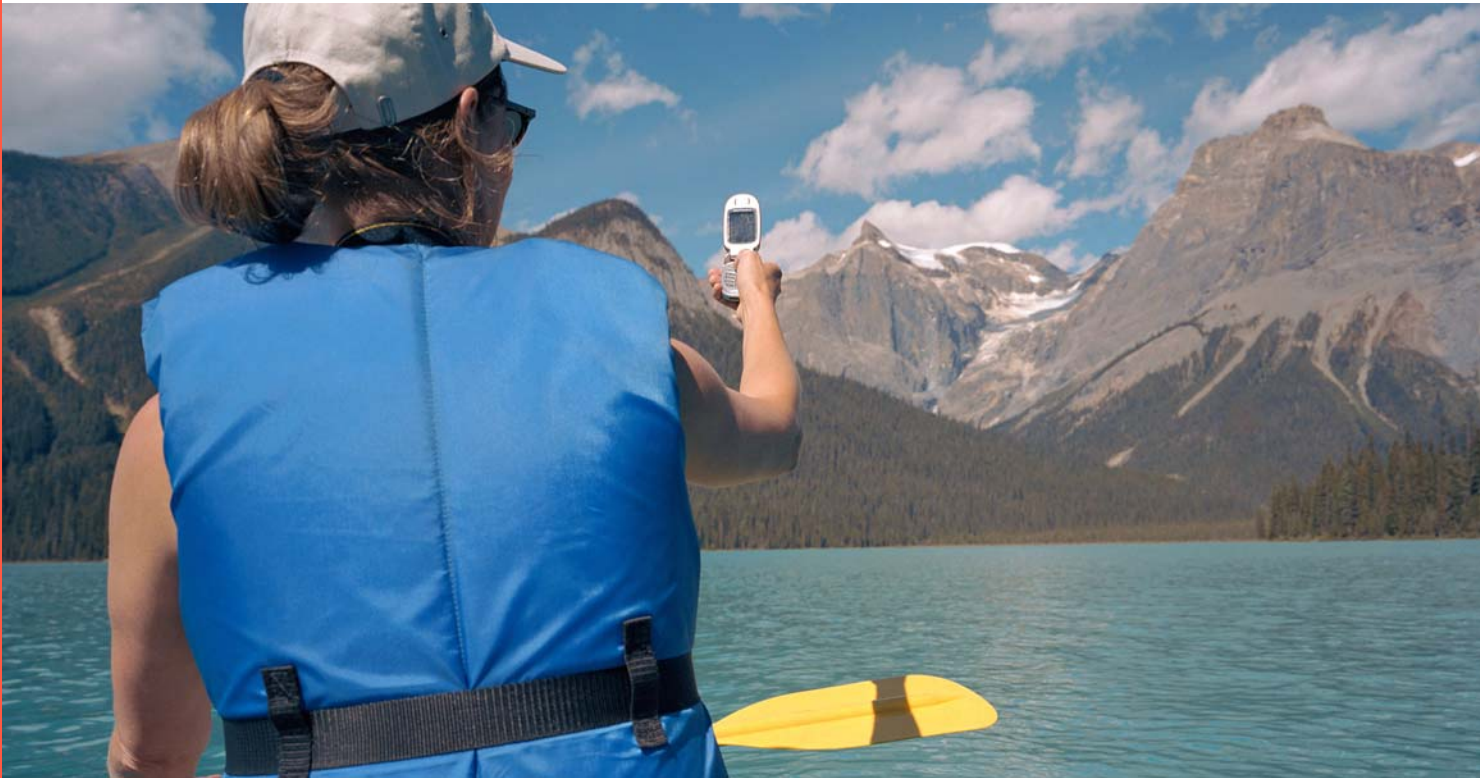# OV3640 3.1 Megapixel product brief

lead free

available in
a lead-free
package

1/4-inch, high-performance 3 Megapixel CameraChip™ sensor with image stabilization and MIPI

The OV3640 is a feature-rich, high-performance 3.1 Megapixel CMOS CameraChip™ sensor in a 1/4 inch optical format. It is based on OmniVision's new 1.75µm OmniPixel3™ architecture with ultra low stack height (ULSH) for excellent low light sensitivity (500mV/lux-sec) and significantly improved noise and dynamic range (65dB).

The highly integrated OV3640 incorporates an extremely advanced Image Signal Processor (ISP) with new features such as an advanced image stabilization/anti-shake (AS) engine that requires no external components. An embedded microcontroller supports the internal auto focus (AF) engine and the programmable general purpose I/O modules enable external auto focus control.

The OV3640's image array operates at up to 15 frames per second (fps) in full 3-megapixel resolution (QXGA) transferred over a two lane MIPI interface or a traditional digital video port (DVP). The sensor also contains an integrated compression engine (JPEG), simplifying bandwidth limited interfaces.

The fully integrated and feature-rich OV3640 is small enough to fit standard 8 x 8 mm fixed focus sockets as well as 8.5 x 8.5mm AF sockets, making it ideal for drop-in upgrades of existing camera modules used in existing lower mega-pixel camera phone designs.

The OV3640's ISP can also be used by an external secondary camera via its DVP while providing continued output through the MIPI interface for the primary camera.
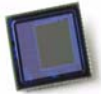
For identification purposes, the OV3640 also includes a one time programmable (OTP) memory. All required image processing functions are programmable through the SCCB interface or the integrated micro-controller.

Omni Vision.

applications

- cellular phones
- toys
- PC multimedia
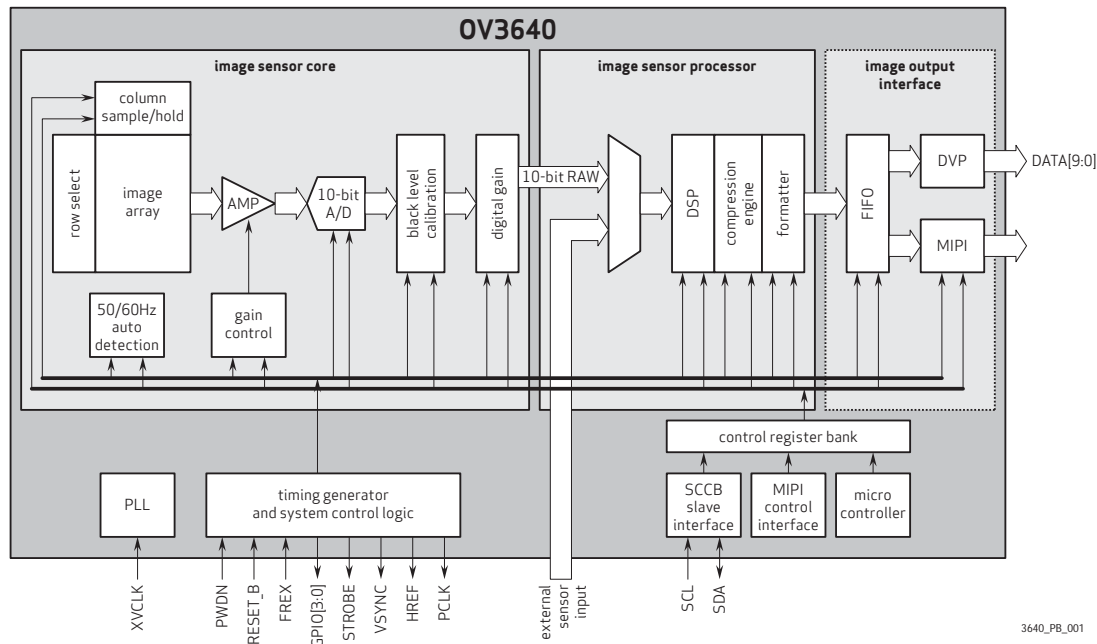- digital still cameras
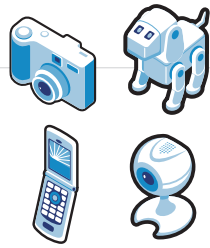
OV3640

product features

- ultra low power and low cost
- automatic image control functions:
  – automatic exposure control (AEC)
  – automatic white balance (AWB)
  – automatic band filter (ABF)
  – automatic 50/60 Hz luminance
  – detection, and automatic black level calibration (ABLC)
- support for output formats: RAW RGB, RGB565/555/444, YUV422/420, YCbCr422 and compression
- programmable controls for frame rate, AEC/AGC 16-zone size/position/weight control, mirror and flip, scaling, cropping, windowing, and panning
- image quality controls: color saturation, hue, gamma, sharpness (edge enhancement), lens correction, defective pixel canceling, and noise canceling

- support for:
  – video or snapshot operations
  – auto focus control (AFC)
  – horizontal/vertical sub-sampling, data compression output, auto focus control (AFC) and anti-shake
  – internal and external frame synchronization
  – LED and flash strobe mode
  – support for second camera chip-sharing MIPI interface
- standard serial SCCB interface
- digital video port (DVP) parallel output interface
- MIPI serial output interface
- embedded microcontroller
- embedded one-time programmable (OTP) memory
- integrated anti-shake

product specifications

- **array size:** 2048 x 1536
- **power supply:**
  core: 1.5VDC $\pm$ 5%
  analog: 2.5 - 3.0V
  digital: 1.7V - 3.0V
- **output format (8-bit):**
  YUV(422/420) / YCbCr422, RGB565/555/444, 8-bit compression data, 8-/10-bit raw RGB data
- **lens size:** 1/4"
- **image area:** 3626 μm x 2709 μm

- **input clock frequency:** 6 - 54 MHz
- **maximum image transfer rate:**
  QXGA (2048 x 1536): 15fps for QXGA and any size scaling down from QXGA
  XGA (1024 x 768): 30fps for XGA and any size scaling down from XGA
- **chief ray angle:** 25° non-linear
- **pixel size:** 1.75 μm x 1.75 μm
- **temperature range:**
  operating: -20° C to 70° C
  stable image: 0° C to 50° C

functional block diagram

3640_PB_001

Version 1.02, December, 2007