

OV2650 2 Megapixel product brief



ultra small 1/5" 2 Megapixel CameraChip™ sensor with High Dynamic Range (HDR) and anti-shake functionality

The OV2650 is a single-chip, high-performance 2 Megapixel CMOS CameraChip sensor with a 1/5" optical format. The OV2650 is based on OmniVision's new 1.75 μm OmniPixel3™ architecture which uses Ultra Low Stack Height (ULSH) pixels that allows for improved low light sensitivity (520 mV/lux-sec). This new pixel architecture also makes it possible for the OV2650 to fit in a 6.5 x 6.5 mm camera module.

Even with such a small footprint, the OV2650 is a feature-rich device that includes an advanced Image Signal Processor (ISP) and several new innovative features, such as image stabilization (anti-shake) and HDR mode.

The HDR mode of the OV2650 has a unique feature that enables it to increase the dynamic range from 65 dB in full resolution to about 85 dB in half resolution, a useful function for video capturing.

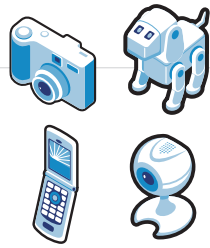
The OV2650 operates at up to 15 frames per second (fps) in full resolution and 30 fps in SVGA mode. The captured data can be transferred either by a standard parallel digital video port (DVP) or by a single-lane MIPI high-speed serial interface. The DVP can also be used for input from an external secondary camera, enabling the advanced ISP of the OV2650 to be used by the secondary camera with continued output through the MIPI interface.

All required image processing functions are programmable through the Serial Camera Control Bus (SCCB) interface.

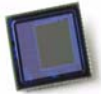
For identification purposes, the OV2650 includes a one-time programmable (OTP) memory.

applications

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



OV2650



ordering information

- **OV02650-VL9A**
(color, lead-free, 38-pin CSP2)

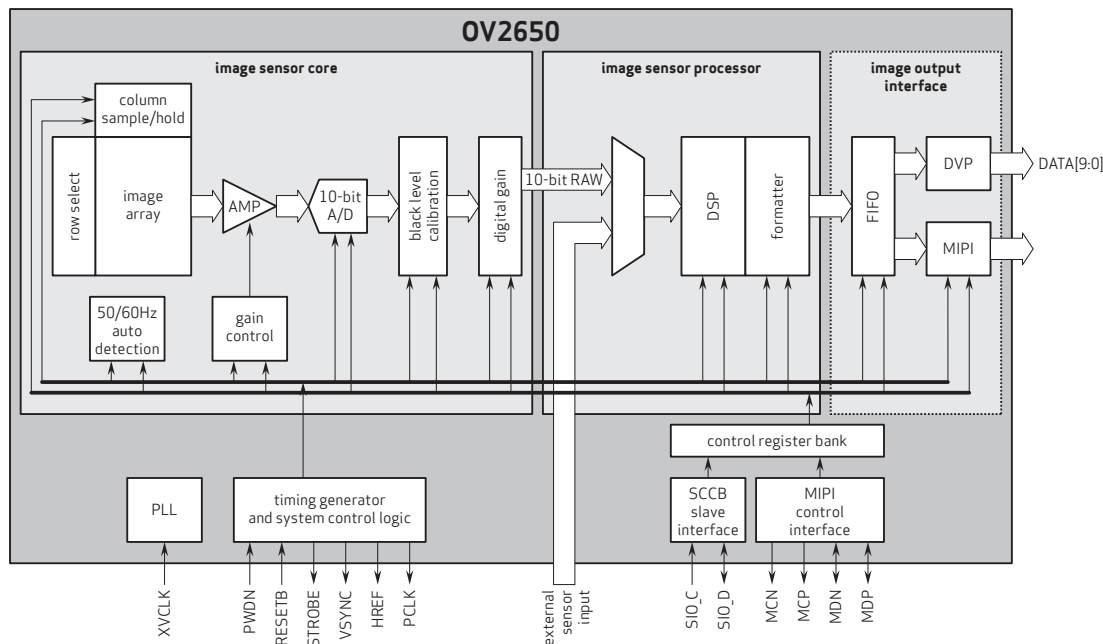
product features

- 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
 - automatic black level calibration (ABLC)
- support for output formats: RAW, RGB, RGB565/555, YUV422/420, and YCbCr422
- programmable controls for frame rate, AEC/AGC 16-zone size/position/weight control, mirror and flip, scaling, cropping, and windowing
- 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
 - internal and external frame synchronization
 - LED and flash strobe mode
 - second CameraChip-sharing ISP and 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:** 1600 x 1200
- **power supply:**
 - core: 1.5 VDC \pm 5%
 - analog: 2.45 V - 3.0 V
 - digital: 1.7 V - 3.0V
- **output format (8-bit):** YUV(422/420) / YCbCr422, RGB565/555, 8-/10-bit raw RGB data
- **lens size:** 1/5"
- **chief ray angle:** 25° non-linear
- **input clock frequency:** 6 - 27 and 54 MHz
- **pixel size:** 1.75 μ m x 1.75 μ m
- **shutter:** rolling shutter
- **maximum exposure interval:** 1235 x t_{row}
- **power requirements:**
 - active: 250 mW
 - standby: 30 μ A
- **max image transfer rate:**
 - UXGA (1600 x 1200):** 15fps for UXGA and any size scaling down from SXGA
 - SVGA (800 x 600):** 30fps for SVGA and any size scaling down from SVGA
- **temperature range:**
 - operating: -20° C to 70° C
 - stable image: 0° C to 50° C

functional block diagram



2650_PB_001

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