

Fall 2007  
product guide



# product and technology highlights

## OmniPixel2™ technology

Introduced in late 2005, OmniPixel2's pixel size of just 2.2 micron is less than half that of its predecessor, thanks to process and technology improvements that use OmniVision's proprietary 0.13-micron process. With operations optimized at both the sensor and system level, better performance per area and a further reduction in overall sensor size is achieved through three major improvements that increase pixel density and maximize pixel performance:

- increase in fill factor by 40 percent, offering significantly improved and true-to-life images

- zero-gap micro-lens design that eliminates the space between the lenses placed over each pixel, leading to a more efficient direction of light to the pixel's active area where pixels can more effectively capture over 20 percent more light using the smaller pixel's active area

- pixel design that features higher quantum efficiency and improved full-well capacity, meaning significant improvement in the pixel's dynamic range

Combined, these three technology/process improvements result in a very high dynamic range, enabling unparalleled performance in low-light conditions.

## OmniPixel3™ technology

Featuring a 1.75 x 1.75 micron pixel size, OmniVision's third-generation pixel design delivers best-in-class low light sensitivity, enhanced performance and improved image quality in a small form factor. Using leading-edge design rules and a proprietary 0.11-micron CMOS process, OmniPixel3 incorporates several significant technology developments, enabling increased pixel density and maximizing the performance of the new 1.75-micron pixel:

- optimized photodiode processes and pixel design for high full-well capacity

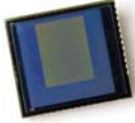
- low-noise pixel and column sense readout that avoids color distortion, offering a dynamic range of up to 65dB

- fill factor improvements of up to 20% and increased sensitivity, delivering more vibrant, true-to-life color reproduction

- new color filter array and zero-gap micro-lens technology that provides excellent sensitivity and superior cross-talk performance

- ultra low dark current (30 e/sec) and low defect density – ideal for use in low-light and variable light conditions

- new transfer gate design process and contact technologies for lag-free operation, ensuring that no 'ghost' images or unwanted noise are present in the imaging process



## OV2650

The OV2650 is the industry's smallest 2-megapixel CameraChip™ sensor with High Dynamic Range (HDR) and anti-shake technology to greatly enhance the picture taking experience. With its 1/5-inch optical format, the OV2650 offers a drop-in upgrade for existing VGA and 1.3-megapixel camera phone designs. The OV2650 is based on OmniVision's most advanced 1.75-micron OmniPixel3™ architecture delivering a number of key features that improve the camera user experience:

- integrated HDR mode that captures differing light levels in a single image, rapidly adjusting to give clear shots every time

- on-board image stabilization that automatically senses the slightest camera movement and makes adjustments accordingly

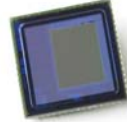
- standard parallel serial and high-speed single lane MIPI interface

- standard module size: 6.5 x 6.5 x 3.5 mm

- zooming and panning window functions

- 15fps full frame rolling shutter

- advanced image signal processing that includes sharpness (edge enhancement), noise reduction, lens correction, defective pixel canceling



## OV3640

The OV3640 is a 1/4-inch, feature rich 3-megapixel CameraChip sensor with anti-shake technology and embedded auto-focus control. A newly added hardware feature enables cameras using the OV3640 to take advantage of Scalado SpeedView™ technology, allowing faster picture taking and faster photo viewing on camera phones. Additional features and improvements focused specifically on improving image quality and camera performance include:

- advanced image stabilization that prevents blurring and produces sharper images

- high speed, two-lane MIPI interface

- parallel interface with or without JPEG compression

- zooming and windowing functions

- 15fps full frame rolling shutter

- 1.75-micron OmniPixel3™ architecture

- fits standard 8 x 8 mm sockets used in 2-megapixel camera phones – ideal drop-in upgrade for existing handset designs

- advanced image signal processing that includes sharpness (edge enhancement), noise reduction, lens correction, defective pixel canceling

part number	resolution	optical format	pixel size	frame rate	output format	pwr consumption at full resolution	package options	technology	target applications
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## 5.17 Mpixel digital image sensors

OV5620-C03A	QVGA, SXGA, VGA, HF, D1	1/2.5"	2.2 x 2.2 $\mu\text{m}$	7.5 - 120 fps	Raw RGB data	75 mA	48-pin CLCC	OmniPixel2™	video phones, digital camcorders, digital still cameras, webcams
OV5620-G00A	QVGA, SXGA, VGA, HF, D1	1/2.5"	2.2 x 2.2 $\mu\text{m}$	7.5 - 120 fps	Raw RGB data	75 mA	COB (no backgrinding)	OmniPixel2™	camera/video phones
OV5623-G00A	QVGA	1/2.5"	2.2 x 2.2 $\mu\text{m}$	7.5 - 120 fps	Raw RGB data	75 mA	COB (no backgrinding)	OmniPixel2™	camera/video phones



part number	resolution	optical format	pixel size	frame rate	output format	pwr consumption at full resolution	package options	technology	target applications
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### 3.2 Mpixel digital image sensors

OV3630-VL5A	QXGA, XGA, HF	1/3"	2.2 x 2.2 $\mu\text{m}$	15 fps full res	Raw RGB data	<110 mW (active)	36-pin CSP2	OmniPixel2™	camera/video phones, digital camcorders, digital still cameras, webcams
OV3630-G00A	QXGA, XGA, HF	1/3"	2.2 x 2.2 $\mu\text{m}$	15 fps full res	Raw RGB data	<110 mW (active)	COB (no backgrinding)	OmniPixel2™	camera/video phones, digital camcorders, digital still cameras, webcams
OV3632-VL5A	QXGA, XGA, HF	1/3"	2.2 x 2.2 $\mu\text{m}$	15 fps full res	Raw RGB data	55 mA	36-pin CSP2	OmniPixel2™	camera/video phones, digital camcorders, digital still cameras, webcams
OV3640-VL9A OV3640-G00A OV3640-G03A	QXGA, XGA, and below	1/4"	1.75 x 1.75 $\mu\text{m}$	15 fps full res	Raw RGB data, RGB, compressed data, YUV	TBD	56-pin CSP2 COB (no backgrinding) COB (reconstructed wafer)	OmniPixel3™	camera/video phones, digital camcorders, digital still cameras, webcams, games/toys, portable multimedia player, personal navigation device

### 2.0 Mpixel digital image sensors

OV2640-VL9A	UXGA, SVGA and below	1/4"	2.2 x 2.2 $\mu\text{m}$	15 fps full res	Raw RGB data, RGB, compressed data, YUV	125 mW (YUV) 140 mW (compressed)	38-pin CSP2	OmniPixel2™	camera/video phones, digital camcorders, digital still cameras, webcams, games/toys, portable multimedia player, personal navigation device
OV2640-G00A OV2640-G03A	UXGA, SVGA and below	1/4"	2.2 x 2.2 $\mu\text{m}$	15 fps full res	Raw RGB data, RGB, compressed data, YUV	125 mW (YUV) 140 mW (compressed)	COB (no backgrinding) COB (reconstructed wafer)	OmniPixel2™	camera/video phones, digital camcorders, digital still cameras, webcams, games/toys, portable multimedia player, personal navigation device
OV2650-VL9A OV2650-G00A OV2650-G03A	UXGA, SVGA and below	1/5"	1.75 x 1.75 $\mu\text{m}$	15 fps full res	Raw RGB data, RGB, YUV	TBD	38-pin CSP2 COB (no backgrinding) COB (reconstructed wafer)	OmniPixel3™	camera/video phones, digital camcorders, digital still cameras, webcams, games/toys, portable multimedia player, personal navigation device

### 1.3 Mpixel digital image sensors

OV9653-VL1A OV9653-G03A	SXGA, VGA, QVGA, CIF, QCIF, QQVGA, QQCIF	1/4"	3.18 x 3.18 $\mu\text{m}$	15 - 60 fps 120 fps	YUV, RGB, Raw RGB data	50 mW (active)	28-pin CSP2, COB (reconstructed wafer)	OmniPixel®	camera/video phones, digital still cameras, webcams, games/toys
OV9655-VL1A OV9655-G00A OV9655-G03A	SXGA, VGA and below	1/4"	3.18 x 3.18 $\mu\text{m}$	15 - 30 fps	YUV, RGB, Raw RGB data	90 mW (active)	28-pin CSP2 COB (no backgrinding) COB (reconstructed wafer)	OmniPixel®	camera/video phones, digital still cameras, webcams, games/toys
OV9656-VL1A	SXGA, VGA, CIF and below	1/4"	3.18 x 3.18 $\mu\text{m}$	15 - 30 fps	YUV, RGB, Raw RGB data	90 mW (active)	28-pin CSP2	OmniPixel®	camera/video phones, digital still cameras, webcams, games/toys
OV9660-VL9A OV9660-G03A	SXGA, VGA, QVGA CIF and below	1/5"	2.0 x 2.0 $\mu\text{m}$	15 - 60 fps	YUV, RGB, Raw RGB data	120 mW (active)	26-pin CSP2, COB (reconstructed wafer)	OmniPixel2™	camera/video phones, digital still cameras, webcams, games/toys

part number	resolution	optical format	pixel size	frame rate	output format	pwr consumption at full resolution	package options	technology	target applications
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## VGA (640 x 480) digital image sensors

OV7141-C01A OV7141-P01A	VGA, QVGA	1/4"	5.6 x 5.6 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	28-pin CLCC 28-pin PLCC	CMOS	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7148-KL6A	VGA, QVGA	1/4"	5.6 x 5.6 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	22-pin CSP	CMOS	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7161-G00A OV7161-KL6A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	COB (no backgrinding) 22-pin CSP	OmniPixel®	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7211-C00A	VGA, QVGA	1/4"	6.0 x 6.0 µm	30 - 60 fps	YUV, RGB	140 mW (active)	48-pin CLCC	OmniPixel2™	camera/video phones, medical, pattern/face recognition, games/toys, security/surveillance
OV7211-F00V	VGA	1/4"	6.0 x 6.0 µm	30 - 60 fps	YUV, RGB	140 mW (active)	48-pin QFP	OmniPixel2™	automotive
OV7221-C01A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm	60 fps for VGA	YUV, RGB	120 mW typical	28-pin CLCC	OmniPixel2™	camera/video phones, medical, pattern/face recognition, games/toys, security/surveillance
OV7221-VL1A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm	60 fps for VGA	YUV, RGB	120 mW typical	28-pin CSP2	OmniPixel2™	camera/video phones, medical, pattern/face recognition, games/toys, security/surveillance
OV7640-C01A OV7640-P01A	VGA, QVGA	1/4"	5.6 x 5.6 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	28-pin PLCC	CMOS	camera/video phones, webcams, medical, pattern/face recognition, games/toys
OV7648-KL6A OV7649-KL6A	VGA, QVGA	1/4"	5.6 x 5.6 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	22-pin CSP	CMOS	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7650-KL6A	VGA, QVGA, CIF, QCIF	1/4"	5.6 x 5.6 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	22-pin CSP	CMOS	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7660-KL6A OV7660-G00A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	22-pin CSP COB (no backgrinding)	OmniPixel®	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7663-VL6A OV7663-G03A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm	30 - 60 fps	YUV, RGB, Raw RGB data	40 mW (active)	22-pin CSP2 COB (reconstructed wafer)	OmniPixel®	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7668-G00A	VGA, sub-sampling mode	1/5"	4.2 x 4.2 µm	30 - 60 fps	Raw RGB data, SMIA	50 mW (active)	COB (no backgrinding)	OmniPixel®	camera/video phones (SMIA)
OV7670-VL2A OV7670-G00A OV7670-G03A	VGA, CIF and below	1/6"	3.6 x 3.6 µm	30 fps	YUV, RGB, Raw RGB data	60 mW (active)	24-pin CSP2 COB (no backgrinding) COB (reconstructed wafer)	OmniPixel®	camera/video phones, digital still cameras, webcams, medical, games/toys
OV7680-VL2A OV7680-G00A OV7680-G03A	VGA	1/10"	2.2 x 2.2 µm	30 fps for VGA	YUV, RGB, Raw RGB data	80 mW typical	24-pin CSP2 COB (no backgrinding) COB (reconstructed wafer)	OmniPixel2™	camera/video phones, digital still cameras, webcams, games/toys
OV7710-C00A	VGA, QVGA	1/4"	6.0 x 6.0 µm	30 - 60 fps	YUV, RGB	140mW (active)	48-pin CLCC	OmniPixel2™	camera/video phones, medical, pattern/face recognition, security/surveillance
OV7710-F00V	VGA	1/4"	6.0 x 6.0 µm	30 - 60 fps	YUV, RGB	140mW (active)	48-pin QFP	OmniPixel2™	automotive
OV7720-C01A OV7720-VL1A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm	60 fps for VGA	YUV, RGB	120mW typical	28-pin CLCC 28-pin CSP2	OmniPixel2™	camera/video phones, medical, pattern/face recognition, games/toys, security/surveillance
OV7725-VL1A OV7725-G00A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm	60 fps for VGA	YUV, RGB	120mW typical	28-pin CSP2 COB (no backgrinding)	OmniPixel2™	camera/video phones, medical, pattern/face recognition, games/toys, security/surveillance

part number	resolution	optical format	pixel size	frame rate	output format	pwr consumption at full resolution	package options	technology	target applications
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### VGA (640 x 480) digital image sensors

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OV10121-C00A	WVGA, VGA, QVGA	1/3" to 1/4"	6.0 x 6.0 $\mu$ m	30 - 60 fps	HDR YUV, Raw RGB	-200 mW	48-pin CLCC	CMOS	camera/video phones, security/surveillance
OV10121-Q00V	WVGA	1/3" to 1/4"	6.0 x 6.0 $\mu$ m	30 - 60 fps	HDR YUV, Raw RGB	-200 mW or less	48-pin QFP	CMOS	automotive
OV10620-C00A	WVGA, VGA, QVGA	1/3" to 1/4"	6.0 x 6.0 $\mu$ m	30 - 60 fps	HDR YUV, Raw RGB	-200 mW	48-pin CLCC	CMOS	camera/video phones, security/surveillance
OV10620-Q00V	WVGA	1/3" to 1/4"	6.0 x 6.0 $\mu$ m	30 - 60 fps	HDR YUV, Raw RGB	-200 mW or less	48-pin QFP	OmniPixel2™	automotive

### analog

OV5116-C11A OV5116-C21A	320 x 240 352 x 288	1/4"	9.1 x 8.7 $\mu$ m	60fields/sec 50fields/sec	NTSC PAL	70 mW standard loading	28-pin LCC	CMOS	security/surveillance, medical, games/toys
OV6920-VL9A	320 x 240	1/18"	2.5 x 2.5 $\mu$ m	60fields/sec	NTSC	<35 mA without loading	9-pin CSP2	OmniPixel®	camera/video phone, security/surveillance, medical, games/toys
OV7451-C10A OV7451-F10A	656 x 492	1/4"	6.0 x 6.0 $\mu$ m	60fields/sec	NTSC	200 mW 150 mW with 75ohm loading	48-pin CLCC 48-pin QFP	OmniPixel2™	security/surveillance automotive
OV7949-C10A OV7949-C20A	510 x 496 628 x 586	1/3"	9.2 x 7.2 $\mu$ m	60fields/sec 50fields/sec	NTSC PAL	168 mW with 75ohm loading	48-pin CLCC	OmniPixel2™	camera/video phone, medical, security/
OV7949-Q10V OV7949-Q20V	510 x 496 628 x 586	1/3"	9.2 x 7.2 $\mu$ m	60fields/sec 60fields/sec	NTSC PAL	250 mW with 75ohm loading	48-pin QFP	OmniPixel2™	automotive
OV7950-C10A	656 x 492	1/4"	6.0 x 6.0 $\mu$ m	60fields/sec	NTSC	200 mw	48-pin CLCC	OmniPixel2™	security/surveillance games/toys
OV7950-F10V	656 x 492	1/4"	6.0 x 6.0 $\mu$ m	60fields/sec	NTSC	150 mW with 75ohm loading	48-pin QFP	OmniPixel2™	automotive

### SQUARE GA™ (400 x 400) digital image sensors

OV6680-VL9A	SGA	1/9"	3.6 x 3.6 $\mu$ m	30 fps at full resolution	YUV, RGB Raw RGB data	70 mW typical	23-pin CSP2	OmniPixel2™	camera/video phones, webcams, games/toys, pattern/face recognition
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### CIF (352 x 288) digital image sensors

OV6130-C00A	CIF, QCIF	1/4"	9.0 x 8.2 $\mu$ m	Up to 60 fps		<20 mA (active)	48-pin CLCC	CMOS	camera/video phones, webcams, medical, security/surveillance
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