OmniVision™

2008

Fall product guide

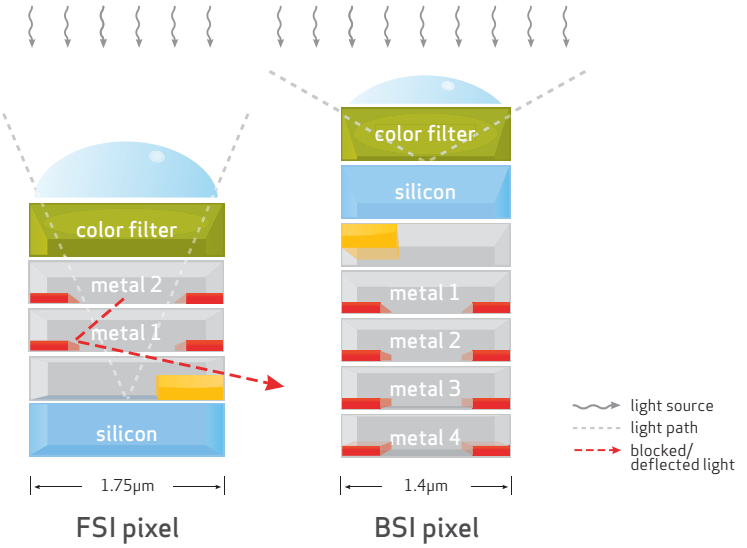
turning the imaging world upside down

OmniBSI™ - Backside Illumination Technology

OmniBSI represents a revolution in the mass production of CMOS image sensors (CIS), adopting a radically different approach to traditional pixel architectures. Using Backside Illumination (BSI) technology, OmniBSI offers CIS architectures for generations to come by enabling continued improvements in sensitivity, color reproduction and image quality while continuing the design shrink down to 0.9 µm pixels.

OmniBSI technology involves turning the image sensor upside down and applying the color filters and micro lenses to the backside of the pixels so that light is collected through the backside of the sensor. OmniBSI effectively reverses the arrangement of layers so that metal and dielectric layers reside below the sensor array, providing the most direct path for light to travel into the pixel, which optimizes the fill factor to deliver best-in-class low-light sensitivity.

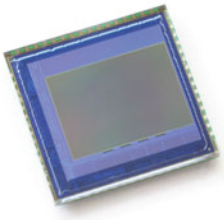
This approach differs from conventional front side illumination (FSI) architectures, where light travels to the photo-sensitive area through the front side of the pixel. This requires the light to first pass through transistors, dielectric layers and metal circuitry, which can block or deflect it into neighboring pixels, causing a reduced fill factor and additional problems such as cross talk between pixels.



OmniBSI Advantages

- best-in-class light absorption
- high quantum efficiency (45% to ›60%)
- excellent lowlight sensitivity (›500mV/lux-sec)
- reduced cross talk (50% over FSI)
- ultra-low stack height (1µm)
- wider chief ray angle (CRA)
- lower f-stops
- thinner camera modules

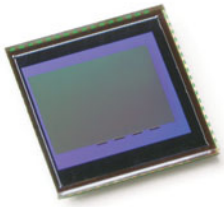
OmniBSI technology further extends OmniVision's competitive edge in digital imaging technology while continuing the use of a production-proven 0.11 µm process technology, providing major cost and performance advantages to our customers.



OV5642

The OV5642 is the world's first 1/4-inch, 5-megapixel SOC CameraChip™ image sensor featuring OmniVision's most advanced 1.4 µm OmniBSI™ architecture and TrueFocus™ ISP. It provides the full functionality of a complete camera on a single chip, including anti-shake technology, auto focus control, MIPI and high-definition support (720p60, 1080p30). The OV5642 delivers best-in-class streaming video and photography for camera phone applications creating the ultimate imaging experience. Additional features focused specifically on improving image quality and camera performance include:

- pixel: 1.4 µm OmniBSI™
  - Backside Illumination technology
  - high sensitivity: >500mV/lux-sec
  - high quantum efficiency (>60%)
  - reduced cross talk (50% less than FSI)
  - ultra-low stack height (1 µm)
- standard module size: 8.5mm x 8.5mm x 6mm
- bridging and daisy chain support: 2nd camera can use MIPI TX and ISP via DVP
- JPEG, thumbnail and Scalado tagging support for faster image preview & zoom
- image sizes/frame rates (binning and on-chip digital scalar supported)
  - 5MP at 15 fps
  - 720p (HD) at 60 fps
  - 1080p (HD) at 30 fps
  - VGA at 60 fps
  - QVGA at 120 fps (slow motion preview)
- anti-shake and auto focus (AF) support



OV8810

The OV8810 is the world's first 1/3-inch 8-megapixel CameraChip™ image sensor built on OmniVision's proprietary 1.4 µm OmniBSI™ backside illumination pixel architecture. OmniBSI delivers best-in-class low-light sensitivity and image quality while reducing sensor size and stack height (1 µm) to enable ultra-thin camera module designs, making the OV8810 ideal for next generation camera phones and other high-end mobile applications. Additional features focused specifically on improving image quality and camera performance include:

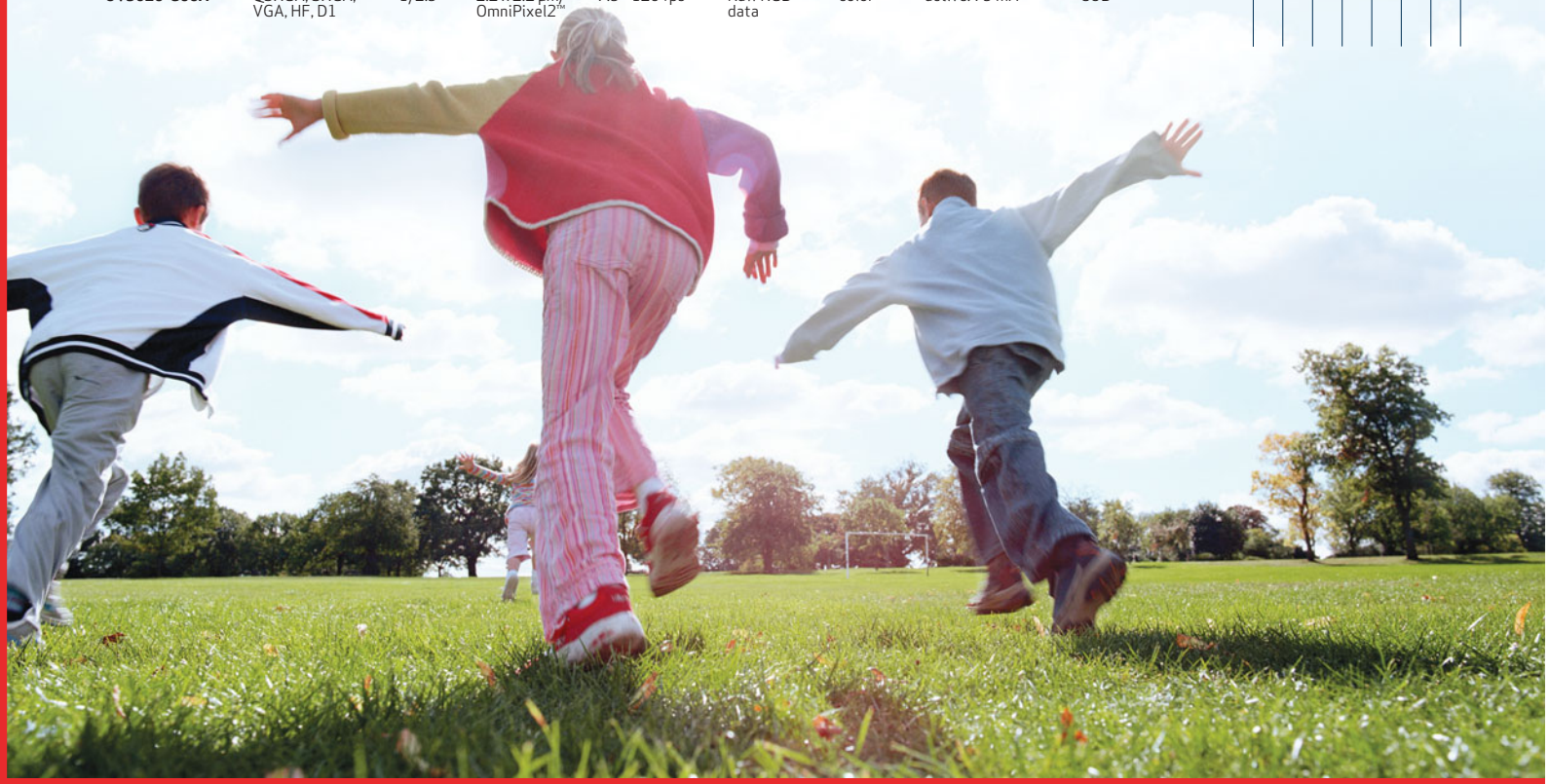
- pixel: 1.4 µm OmniBSI™
  - Backside Illumination technology
  - high sensitivity: >500mV/lux-sec
  - high quantum efficiency (>60%)
  - reduced cross talk (50% less than FSI)
  - ultra-low stack height (1 µm).
- standard module size: 8.5mm x 8.5mm x 7mm
- dual-lane high speed MIPI interface and parallel interface (DVP)
- High Dynamic Range (HDR) ready
- image sizes and frame rates:
  - 8MP at 10 fps
  - 1080p (HD) at 30 fps
  - 720p (HD) at 60 fps
  - VGA at 60 fps
  - QVGA at 120 fps (slow motion preview)

8-megapixel digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV8812-A67A	8Mpixel, 1080p, 720p, VGA, QVGA	1/3.2"	1.4 x 1.4 µm/ OmniBSI™	10 - 120 fps	Raw RGB data	color	active: 170 mA	67-pin CSP3	■								
OV8812-G00A	8Mpixel, 1080p, 720p, VGA, QVGA	1/3.2"	1.4 x 1.4 µm/ OmniBSI™	10 - 120 fps	Raw RGB data	color	active: 170 mA	COB	■								
OV8810-A67A	8Mpixel, 1080p, 720p, VGA, QVGA	1/3.2"	1.4 x 1.4 µm/ OmniBSI™	10 - 120 fps	Raw RGB data	color	active: 170 mA	67-pin CSP3	■								
OV8810-G00A	8Mpixel, 1080p, 720p, VGA, QVGA	1/3.2"	1.4 x 1.4 µm/ OmniBSI™	10 - 120 fps	Raw RGB data	color	active: 170 mA	COB	■								

5-megapixel digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV5642-V63A	QSXGA, 1080p, 720p, VGA, QVGA	1/4"	1.4 x 1.4 µm/ OmniBSI™ w-TrueFocus™	15 - 60 fps	Raw RGB data	color	TBD	63-pin CSP2	■	■					■		
OV5642-G04A	QSXGA, 1080p, 720p, VGA, QVGA	1/4"	1.4 x 1.4 µm/ OmniBSI™ w-TrueFocus™	15 - 60 fps	Raw RGB data	color	TBD	RW	■	■					■		
OV5633-C48A	QSXGA, 1080p, 720p, VGA, QVGA	1/3.2"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 - 60 fps	Raw RGB data	color	active: 150 mA	48-pin CLCC			■						■
OV5630-V58A	QSXGA, 1080p, 720p, VGA, QVGA	1/3.2"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 - 60 fps	Raw RGB data	color	active: 150 mA	58-pin CSP2	■						■		
OV5630-G04A	QSXGA, 1080p, 720p, VGA, QVGA	1/3.2"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 - 60 fps	Raw RGB data	color	active: 150 mA	RW	■						■		
OV5630-G00A	QSXGA, 1080p, 720p, VGA, QVGA	1/3.2"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 - 60 fps	Raw RGB data	color	active: 150 mA	COB	■						■		
OV5623-G00A	QSXGA	1/2.5"	2.2 x 2.2 µm/ OmniPixel2™	7.5 - 120 fps	Raw RGB data	color	active: 75 mA	COB	■								
OV5620-C48A	QSXGA, SXGA, VGA, HF, D1	1/2.5"	2.2 x 2.2 µm/ OmniPixel2™	7.5 - 120 fps	Raw RGB data	color	active: 75 mA	48-pin CLCC			■						■
OV5620-G00A	QSXGA, SXGA, VGA, HF, D1	1/2.5"	2.2 x 2.2 µm/ OmniPixel2™	7.5 - 120 fps	Raw RGB data	color	active: 75 mA	COB			■						■



3-megapixel digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV3647-V47A	QXGA, XGA, HF	1/4"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	Raw RGB data	color	active: 70 mA standby: 20 µA	47-pin CSP2	■	■	■						
OV3647-G04A	QXGA, XGA, HF	1/4"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	Raw RGB data	color	active: 70 mA standby: 20 µA	RW	■	■	■						
OV3640-V56A	QXGA, XGA, and below	1/4"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	YUV, Raw RGB data, RGB, compressed data	color	active: 75 mA standby: 20 µA	56-pin CSP2	■	■	■						
OV3640-G00A	QXGA, XGA, and below	1/4"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	YUV, Raw RGB data, RGB, compressed data	color	active: 75 mA standby: 20 µA	COB	■	■	■						
OV3640-G04A	QXGA, XGA, and below	1/4"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	YUV, Raw RGB data, RGB, compressed data	color	active: 75 mA standby: 20 µA	RW	■	■	■						
OV3642-V67A	QXGA, XGA, and below	1/4"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 fps full res	YUV, Raw RGB data, RGB, compressed data	color	active: 350 mW standby: 40 µA	67-pin CSP2	■	■	■						
OV3642-G04A	QXGA, XGA, and below	1/4"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 fps full res	YUV, Raw RGB data, RGB, compressed data	color	active: 350 mW standby: 40 µA	RW	■	■	■						

2-megapixel digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV2655-V38A	UXGA, SVGA and below	1/5"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 fps full res	Raw RGB data, RGB, YUV	color	active: 250 mW standby: 30 µA	38-pin CSP2	■	■	■				■		
OV2655-G04A	UXGA, SVGA and below	1/5"	1.75 x 1.75 µm/ OmniPixel3-HS™	15 fps full res	Raw RGB data, RGB, YUV	color	active: 250 mW standby: 30 µA	RW	■	■	■				■		
OV2650-V38A	UXGA, SVGA and below	1/5"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	Raw RGB data, RGB, YUV	color	active: 250 mW standby: 30 µA	38-pin CSP2	■	■	■				■		
OV2650-G00A	UXGA, SVGA and below	1/5"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	Raw RGB data, RGB, YUV	color	active: 250 mW standby: 30 µA	COB	■	■	■				■		
OV2650-G04A	UXGA, SVGA and below	1/5"	1.75 x 1.75 µm/ OmniPixel3™	15 fps full res	Raw RGB data, RGB, YUV	color	active: 250 mW standby: 30 µA	RW	■	■	■				■		
OV2640-V38A	UXGA, SVGA and below	1/4"	2.2 x 2.2 µm/ OmniPixel2™	15 fps full res	Raw RGB data, RGB, YUV	color	125 mW (YUV) 140 mW (compressed)	38-pin CSP2	■	■	■				■	■	
OV2640-G00A	UXGA, SVGA and below	1/4"	2.2 x 2.2 µm/ OmniPixel2™	15 fps full res	Raw RGB data, RGB, YUV	color	125 mW (YUV) 140 mW (compressed)	COB	■	■	■				■	■	
OV2640-G03A	UXGA, SVGA and below	1/4"	2.2 x 2.2 µm/ OmniPixel2™	15 fps full res	Raw RGB data, RGB, YUV	color	125 mW (YUV) 140 mW (compressed)	RW	■	■	■				■	■	

1-megapixel digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV9710-V28A	WXGA, 1280 x 800	1/4"	3 x 3 µm/ OmniPixel3-HS™	30 - 60 fps	Raw RGB data	color	active: 110 mW	28-pin CSP2	■	■	■	■	■	■		■	■
OV9711-V28A	WXGA, 1280 x 800	1/4"	3 x 3 µm/ OmniPixel3-HS™	30 - 60 fps	Raw	bw	active: 110 mW	28-pin CSP2							■		
OV9665-G03A	SXGA, VGA, QVGA, CIF and below	1/5"	2 x 2 µm/ OmniPixel2™	15 - 60 fps	YUV, RGB, Raw RGB data	color	active: 120 mW	RW	■	■	■					■	
OV9665-V26A	SXGA, VGA, QVGA, CIF and below	1/5"	2 x 2 µm/ OmniPixel2™	15 - 60 fps	YUV, RGB, Raw RGB data	color	active: 120 mW	26-pin CSP2	■	■	■					■	
OV9656-V28A	SXGA, VGA, CIF and below	1/4"	3.18 x 3.18 µm/ OmniPixel®	15 - 30 fps	YUV, RGB, Raw RGB data	color	active: 90 mW	28-pin CSP2	■	■	■					■	
OV9655-V28A	SXGA, VGA and below	1/4"	3.18 x 3.18 µm/ OmniPixel®	15 - 30 fps	YUV, RGB, Raw RGBdata	color	active: 90 mW	28-pin CSP2	■	■	■					■	
OV9655-G00A	SXGA, VGA and below	1/4"	3.18 x 3.18 µm/ OmniPixel®	15 - 30 fps	YUV, RGB, Raw RGB data	color	active: 90 mW	COB	■	■	■					■	
OV9655-G03A	SXGA, VGA and below	1/4"	3.18 x 3.18 µm/ OmniPixel®	15 - 30 fps	YUV, RGB, Raw RGB data	color	active: 90 mW	RW	■	■	■					■	

VGA (640 x 480) digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV10620-C48A	WVGA, VGA QVGA	1/3" to 1/4"	6.0 x 6.0 µm/ CMOS	30 - 60 fps	YUV, Raw RGB data, HDR	color	-200 mW	48-pin CLCC	■			■	■				
OV10620-Q48V	WVGA, VGA QVGA	1/3" to 1/4"	6.0 x 6.0 µm/ CMOS	30 - 60 fps	YUV, Raw RGB data, HDR	color	-200 mW or less	48-pin QFP					■				
OV10121-C48A	WVGA, VGA QVGA	1/3" to 1/4"	6.0 x 6.0 µm/ CMOS	30 - 60 fps	Raw, HDR	bw	-200 mW	48-pin CLCC	■			■	■				
OV10121-Q48V	WVGA	1/3" to 1/4"	6.0 x 6.0 µm/ CMOS	30 - 60 fps	Raw, HDR	bw	-200 mW or less	48-pin QFP					■				
OV7725-V28A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm/ OmniPixel2™	60 fps	RGB, Raw RGB data	color	active: 120 mW	28-pin CSP2	■	■	■				■		
OV7725-G00A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm/ OmniPixel2™	60 fps	RGB, Raw RGB data	color	active: 120 mW	COB	■	■	■				■		
OV7720-V28A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm/ OmniPixel2™	60 fps for VGA	YUV, RGB	color	120 mW typical	28-pin CSP2		■	■	■		■		■	
OV7211-C48A	VGA, QVGA	1/4"	6.0 x 6.0 µm/ OmniPixel2™	30 - 60 fps	Raw	bw	140 mW	48-pin CLCC	■			■		■		■	
OV7211-F48V	VGA	1/4"	6.0 x 6.0 µm/ OmniPixel2™	30 - 60 fps	Raw	bw	active: 140 mW	48-pin QFP					■				
OV7221-C28A	VGA, QVGA, CIF and below	1/4"	6.0 x 6.0 µm/ OmniPixel2™	60 fps for VGA	Raw	bw	120 mW typical	28-pin CSP				■		■	■		
OV7710-C48A	VGA, QVGA	1/4"	6.0 x 6.0 µm/ OmniPixel2™	30 - 60 fps	YUV, RGB	color	active: 140 mW	48-pin CLCC	■	■				■			
OV7710-F48V	VGA	1/4"	6.0 x 6.0 µm/ OmniPixel2™	30 - 60 fps	YUV, RGB	color	active: 140 mW	48-pin QFP					■				
OV7690-A20A	VGA, QVGA	1/13"	1.75 x 1.75 µm/ OmniPixel3™	30 fps for VGA	YUV, RGB, Raw RGB data	color	active: 100 mW	20-pin CSP3	■	■	■				■		
OV7680-V24A	VGA	1/10"	2.2 x 2.2 µm/ OmniPixel2™	30 fps for VGA	YUV, RGB, Raw RGB data	color	80 mW typical	24-pin CSP2	■	■					■		
OV7680-G00A	VGA	1/10"	2.2 x 2.2 µm/ OmniPixel2™	30 fps for VGA	YUV, RGB, Raw RGB data	color	80 mW typical	COB	■	■					■		
OV7680-G03A	VGA	1/10"	2.2 x 2.2 µm/ OmniPixel2™	30 fps for VGA	YUV, RGB, Raw RGB data	color	80 mW typical	RW	■	■					■	■	
OV7670-V24A	VGA, CIF and below	1/6"	3.6 x 3.6 µm/ OmniPixel®	30 fps	YUV, RGB, Raw RGB data	color	active: 60 mW	24-pin CSP2	■	■	■			■		■	
OV7670-G00A	VGA, CIF and below	1/6"	3.6 x 3.6 µm/ OmniPixel®	30 fps	YUV, RGB, Raw RGB data	color	active: 60 mW	COB	■	■	■			■		■	
OV7670-G03A	VGA, CIF and below	1/6"	3.6 x 3.6 µm/ OmniPixel®	30 fps	YUV, RGB, Raw RGB data	color	active: 60 mW	RW	■	■	■			■		■	
OV7663-V22A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm/ OmniPixel®	30 - 60 fps	YUV, RGB, Raw RGB data	color	active: 40 mW	22-pin CSP2	■	■	■			■		■	
OV7663-G03A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm/ OmniPixel®	30 - 60 fps	YUV, RGB, Raw RGB data	color	active: 40 mW	RW	■	■	■			■		■	
OV7660-L22A	VGA, QVGA, QQVGA, CIF QCIF, QQCIF	1/5"	4.2 x 4.2 µm/ OmniPixel®	30 - 60 fps	YUV, RGB, Raw RGB data	color	active: 40 mW	22-pin CSP	■	■	■			■		■	
OV7660-G00A	VGA, QVGA, QQVGA, CIF QCIF, QQCIF	1/5"	4.2 x 4.2 µm/ OmniPixel®	30 - 60 fps	YUV, RGB, Raw RGB data	color	active: 40 mW	COB	■	■	■			■		■	
OV7161-L22A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm/ OmniPixel®	30 - 60 fps	Raw	bw	active: 40 mW	22-pin CSP	■	■	■			■		■	
OV7161-G00A	VGA, QVGA, QQVGA, CIF, QCIF, QQCIF	1/5"	4.2 x 4.2 µm/ OmniPixel®	30 - 60 fps	Raw	bw	active: 40 mW	COB	■	■	■			■		■	
OV7148-L22A	VGA, QVGA	1/4"	5.6 x 5.6 µm/ CMOS	30 - 60 fps	Raw	bw	active: 40 mW	22-pin CSP	■	■	■			■		■	
OV7141-C28A	VGA, QVGA	1/4"	5.6 x 5.6 µm/ CMOS	30 - 60 fps	Raw	bw	active: 40 mW	28-pin CLCC	■	■	■			■		■	

analog NTSC

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV7950-F48V	656 x 406	1/4"	6.0 x 6.0 µm/ OmniPixel2™	60fields/sec	NTSC	color	150 mW with 75 Ω loading	48-pin QFP				■					
OV7950-C48N	656 x 406	1/4"	6.0 x 6.0 µm/ OmniPixel2™	60fields/sec	NTSC	color	200 mW	48-pin CLCC			■					■	
OV7949-C48N	510 x 496	1/3"	9.2 x 7.2 µm/ OmniPixel2™	60fields/sec	NTSC	color	168 mW with 75 Ω loading	48-pin CLCC	■		■		■				
OV7949-C48V	510 x 496	1/3"	9.2 x 7.2 µm/ OmniPixel2™	60fields/sec	NTSC	color	250 mW with 75 Ω loading	48-pin QFP				■					
OV7451-C48N	656 x 406	1/4"	6.0 x 6.0 µm OmniPixel2™	60fields/sec	NTSC	bw	200 mW	48-pin CLCC			■					■	
OV7451-F48V	656 x 406	1/4"	6.0 x 6.0 µm OmniPixel2™	60fields/sec	NTSC	bw	150 mW with 75 Ω loading	48-pin QFP				■					
OV6920-V09N	320 x 240	1/18"	2.5 x 2.5 µm/ OmniPixel®	60fields/sec	NTSC	color	<35 mA without loading	9-pin CSP2			■		■			■	
OV5116-C28N	320 x 240	1/4"	9.1 x 8.7 µm/ n/a	60fields/sec	NTSC	bw	70 mW standard loading	28-pin CLCC			■		■			■	

analog PAL

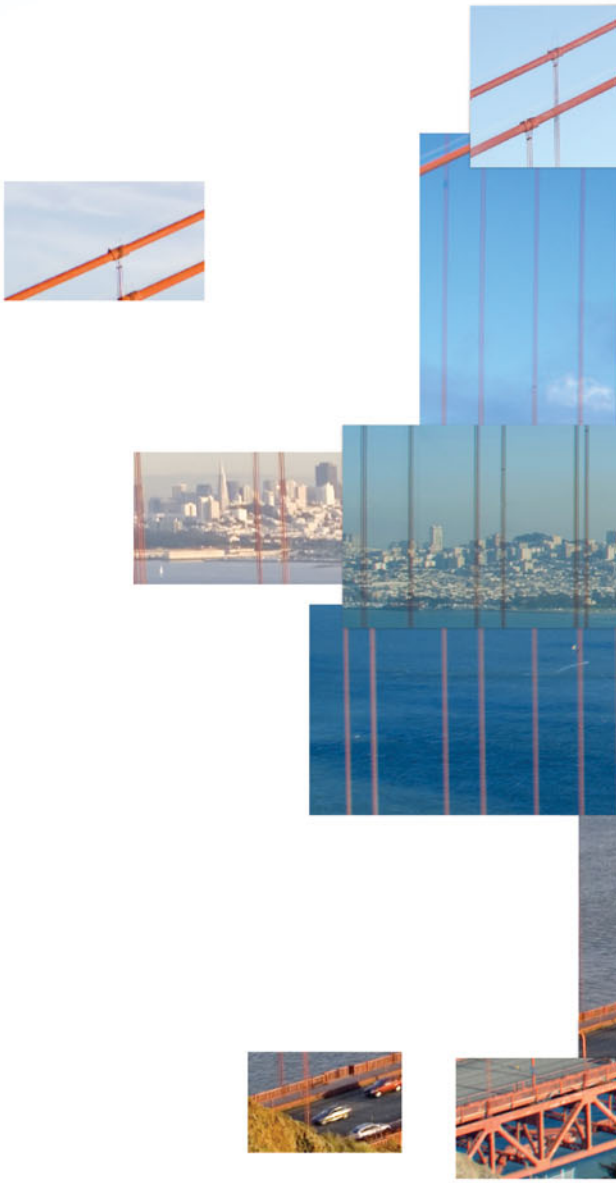
part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV7949-C48P	628 x 586	1/3"	9.2 x 7.2 µm/ OmniPixel2™	60fields/sec	PAL	color	168 mW with 75 Ω loading	48-pin CLCC	■			■		■			
OV7949-Q48W	628 x 586	1/3"	9.2 x 7.2 µm/ OmniPixel2™	60fields/sec	PAL	color	250 mW with 75 Ω loading	48-pin QFP					■				
OV5116-C28P	352 x 288	1/4"	9.1 x 8.7 µm/ n/a	50fields/sec	PAL	bw	70 mW standard loading	28-pin CLCC						■		■	

SQUARE GA™ (400 x 400) digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV6680-V23A	SGA	1/9"	3.6 x 3.6 µm OmniPixel2™	30 fps at full res	YUV, RGB, Raw RGB data	color	70 mW typical	23-pin CSP2	■	■						■	

CIF (352 x 288) digital image sensors

part number	resolution	optical format	pixel size/ technology	frame rate	output format	color/ bw	pwr consumption at full resolution	package options	mobile phone	notebook/PC	DSC	security	automotive	medical	industrial	games/toys	camcorders
OV6130-C48A	CIF, QCIF	1/4"	9.0 x 8.2 µm CMOS	Up to 60 fps	YUV, RGB, Raw RGB data	bw	active: <20 mA	48-pin CLCC	■	■		■		■			



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