

### OV7648 Color CMOS VGA (640 x 480) CAMERACHIP™ OV7148 B&W CMOS VGA (640 x 480) CAMERACHIP™

#### General Description

The OV7648 (color) and OV7148 (black and white) CAMERACHIPS™ are low voltage CMOS image sensors that provide the full functionality of a single-chip VGA (640 x 480) camera and image processor in a small footprint package. The OV7648/OV7148 provides full-frame, sub-sampled or windowed 8-bit images in a wide range of formats, controlled through OmniVision's Serial Camera Control Bus (SCCB) interface.

This product family has an image array capable of operating at up to 30 frames per second (fps) with complete user control over image quality, formatting and output data transfer. All required image processing functions, including exposure control, gamma, white balance, color saturation, hue control and more, are also programmable through the SCCB interface. In addition, OmniVision CAMERACHIPS use proprietary sensor technology to improve image quality by reducing or eliminating common lighting/electrical sources of image contamination such as fixed pattern noise, smearing, blooming, etc. to produce a clean, fully stable color image.

#### Features

- High sensitivity for low-light operation
- 2.5V operating voltage for embedded portable applications
- Standard Serial Camera Control Bus (SCCB) interface
- VGA, QVGA (sub-sampled) and Windowed outputs with Raw RGB, RGB (GRB 4:2:2), YUV (4:2:2) and YCbCr (4:2:2) formats
- Automatic image control functions including: Automatic Exposure Control (AEC), Automatic Gain Control (AGC), Automatic White Balance (AWB), Automatic Brightness Control (ABC), Automatic Band Filter (ABF) for 60Hz noise and Automatic Black-Level Calibration (ABLCL)
- Image quality controls including color saturation, hue, gamma, sharpness (edge enhancement), anti-blooming and zero smearing

#### Ordering Information

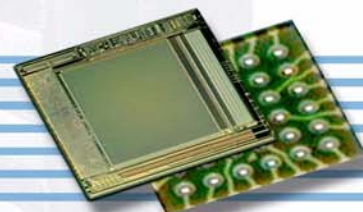
| Product             | Package |
|---------------------|---------|
| OV7648-K06A (Color) | CSP-22  |
| OV7148-K06A (B&W)   | CSP-22  |

#### Applications

- Cellular Phones
- Picture Phones
- Toys
- PC Multimedia

#### Key Specifications

|                                    |                     |  |
|------------------------------------|---------------------|--|
|                                    | <b>Array Size</b>   | 640 x 480 (VGA)  |
| <b>Power Supply</b>                | <b>Core</b>         | 2.5VDC $\pm$ 10%   |
|                                    | <b>Analog</b>       | 2.5VDC $\pm$ 4%  |
|                                    | <b>I/O</b>          | 2.25V to 3.3V  |
| <b>Power Requirements</b>          | <b>Active</b>       | 40 mW (30 fps, including I/O power)  |
|                                    | <b>Standby</b>      | 30 $\mu$ W   |
| <b>Temperature Range</b>           | <b>Operation</b>    | -10°C to 70°C  |
|                                    | <b>Stable Image</b> | 0°C to 50°C  |
| <b>Output Formats (8-bit)</b>      |                     | <ul style="list-style-type: none"> <li>• YUV/YCbCr 4:2:2</li> <li>• RGB 4:2:2</li> <li>• Raw RGB Data</li> </ul> |
| <b>Lens Size</b>                   |                     | 1/4"   |
| <b>Maximum Image Transfer Rate</b> | <b>VGA</b>          | 30 fps   |
|                                    | <b>QVGA</b>         | 60 fps   |
| <b>Sensitivity</b>                 | <b>B&amp;W</b>      | 2.20 V/Lux-sec   |
|                                    | <b>Color</b>        | 1.12 V/Lux-sec   |
| <b>S/N Ratio</b>                   |                     | 46 dB  |
| <b>Dynamic Range</b>               |                     | 62 dB  |
| <b>Scan Mode</b>                   |                     | Progressive/Interlaced   |
| <b>Maximum Exposure Interval</b>   |                     | 523 x t <sub>ROW</sub>   |
| <b>Gamma Correction</b>            |                     | 0.45   |
| <b>Pixel Size</b>                  |                     | 5.6 $\mu$ m x 5.6 $\mu$ m  |
| <b>Dark Current</b>                |                     | 30 mV/s  |
| <b>Well Capacity</b>               |                     | 60 Ke  |
| <b>Fixed Pattern Noise</b>         |                     | < 0.03% of V <sub>PEAK-TO-PEAK</sub>   |
| <b>Image Area</b>                  |                     | 3.6 mm x 2.7 mm  |
| <b>Package Dimensions</b>          |                     | 4930 $\mu$ m x 4760 $\mu$ m  |





All information shown herein is current as of the revision and publication date. Please refer to the OmniVision web site (<http://www.ovt.com>) to obtain the current versions of all documentation.

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