High-Resolution, 3-Megapixel CMOS Digital Image Sensor

Powerful Features

- 3-megapixel resolution (2048H x 1536V)
- 1/2-inch optical format
- 3.2µm x 3.2µm pixel size
- Low-power CMOS image sensor
- 12 frames per second at full resolution (12 fps – QXGA; 20 fps – UXGA; 27 fps – SXGA; 43 fps – XGA; 93 fps – VGA)
- Global pixel reset
- Row and column pixel binning
- Programmable gain and exposure control
- Automatic black level calibration
- Viewfinder and snapshot modes
- On-chip, 10-bit analog-to-digital converter (ADC)
- Pin-for-pin compatible with Aptina’s 1.3-megapixel MT9M001 and 2.0-megapixel MT9D001 CMOS image sensors

Exceptional Functionality

Besides the standard snapshot mode, the MT9T001 offers a global shutter reset, which, when combined with a mechanical shutter, achieves the simultaneous exposure of all rows in a captured image. Two global shutter modes, programmed exposure and bulb mode, provide increased flexibility with either a set or an arbitrary exposure time.

The MT9T001 also supplies row and column binning modes to minimize the visual impact of artifacts introduced when an image is resized. The sensor supports both 2X and 3X reductions of the output resolution and enables independent binning of rows and columns for precise manipulation of images.

Ease of Design, Speed of Development

With fewer required parts compared to CCD-based sensors, Aptina’s MT9T001 CMOS image sensor simplifies camera design. Its on-chip analog-to-digital conversion, clock generation, and other sophisticated camera functions enable designers to create smaller, higher-performance, lower-cost applications within shorter development periods.

Perfect for These Applications

- Digital still cameras
- Digital video cameras
- Converged DSCs/camcorders

How to Buy

Production and sample quantities of Aptina products may be ordered through qualified distributors. See our Web site for details. You may also request access to NDA data sheets and other technical documentation by visiting our Web site.
**Specifications**

- **Pixel Size:** 3.2µm x 3.2µm
- **Array Format (active):** 2048H x 1536V
- **Imaging Area:** 6.55mm x 4.92mm (8.19mm diagonal)
- **Color Filter Array:** RGB Bayer color filters
- **Optical Format:** 1/2 inch (4:3)
- **Frame Rates:** 12 fps (QXGA), 20 fps (UXGA), 27 fps (SXGA), 43 fps (XGA), 93 fps (VGA), with programmable blanking
- **Scan Mode:** Progressive
- **Shutter:** Electronic rolling shutter (ERS), global pixel reset
- **Windowing:** Programmable in size and location
- **Programmable Controls:** Gain, horizontal blanking, vertical blanking, sampling rates, exposure time, auto black level offset correction, image mirroring
- **ADC Resolution:** 10 bit
- **Gain:** Analog – 8X MAX step size 0.125 MIN
- **Data Rate:** 48 megapixels per second
- **Dynamic Range:** >61dB
- **Signal-to-Noise Ratio:** >43dB (MAX)
- **Supply Power:** 3.3V nominal (3.0V to 3.6V)
- **Operating Temperature Range:** 0°C to +60°C
- **Shipping Options:** 48-pin PLCC or die

**Block Diagram**

- **Active-Pixel Sensor (APS) Array**
- **Control Register**
- **Timing and Control**
- **Analog Processing**
- **ADC**

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