1/3-Inch, Wide VGA CMOS Image Sensor

Features

- Wide dynamic range
- TrueSNAP™ global shutter
- Real-time exposure context-switching; dual register
- Operating temperature range up to +105°C
- 752H x 480V active array format (360,960 pixels)
- Monochrome or color
- 2x2 and 4x4 binning at full resolution
- User-programmable window size
- Progressive or interlaced readout modes
- Simple two-wire serial interface
- Automatic and programmable functions: regionally weighted exposure, black level offset correction, horizontal blanking, vertical blanking, lighting control, left-right and top-bottom image reversal, windowing, regional gain, image decimation, manual or automatic high dynamic range control

Applications

- Traffic sign recognition
- Lane departure warning
- Automatic headlamp control
- Adaptive cruise control
- Collision avoidance
- Pedestrian protection
- Occupant identification
- Drowsiness detection
- Smart airbag deployment
- Blind spot detection
- Vehicle theft identification
- Drive-by wire

Overview

The MT9V023 is a 1/3-inch, wide VGA CMOS image sensor, specifically designed for scene-understanding and smart imaging applications. The MT9V023's global shutter, high frame rate, near-infrared sensitivity, and ability to synchronize cameras in stereovision systems are an ideal fit for the demanding automotive environment—as is its ability to perform superbly in extreme temperatures.

It's important that automotive imagers be able to capture areas of relative darkness in scenes of direct sunlight. The MT9V023's wide dynamic range enables better image output in brightly lit scenes and finer knee-point control than previous Micron sensors. And the TrueSNAP global shutter captures fast-moving images without image tearing.

The MT9V023's context-switching feature enables two applications with separate imaging needs—like intelligent headlamps and lane departure warning—to be run from a single sensor (without the processing loads and dropped frames that are typical with other methods). All these features combine to create the ideal automotive image sensor solution.

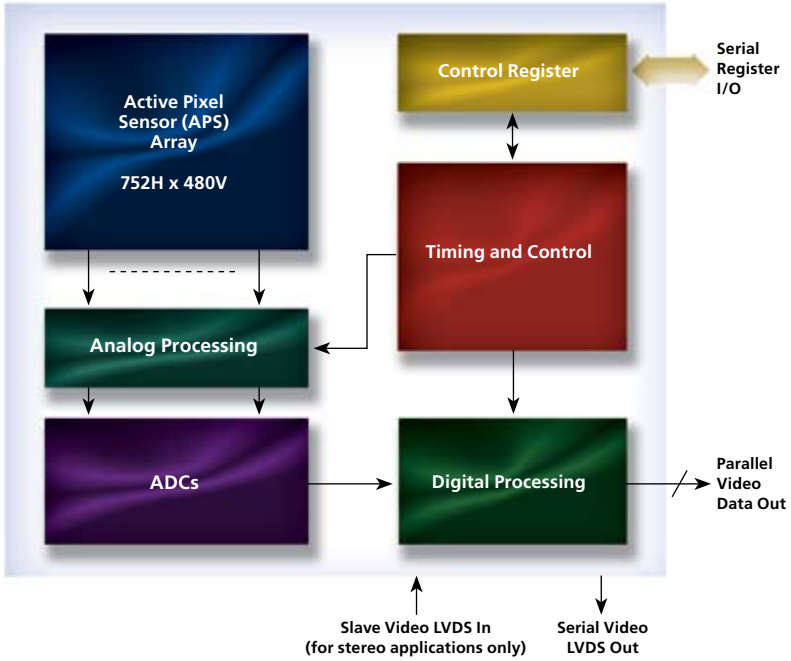
Contact Us

For more information about the MT9V023—or any of our high-performance imaging solutions—contact your local Micron representative.

Specifications

- **Pixel Size:** 6µm x 6µm
- **Array Format Active):** 752(H) x 480(V)
- **Imaging Area:** 4.55mm(H) x 2.97mm(V)
- **Optical Format:** 1/3-inch
- **Color Filter Array:** Monochrome, RGB Bayer, red/clear color filters
- **Frame Rates:** 60 fps @ 752H x 480V; higher frame rates at lower resolutions
- **Dynamic Range:** 80dB to ~120dB
- **Shutter:** TrueSNAP™ global shutter with simultaneous integrate and readout
- **Data Format:** Parallel/LVDS (serial); selectable 10 to 8 bits
- **Window Size:** Programmable to any size (QVGA, CIF, QCIF, etc.)
- **Scan Mode:** Progressive or interlaced
- **ADC:** 10-bit or 12-bit companding
- **Data Rate:** 27 megapixels per second (master clock, 26 MHz)
- **Responsivity:** 4.8 V/lux-sec (550nm)
- **Minimum Detectable Light:** sub-0.1 lux (mono), 5 lux (color)
- **Dark Current:** <10% of saturation signal at +105°C
- **Spectral Range:** 450–1,050nm
- **Quantum Efficiency:** >34% @ 850nm
- **Conversion Gain:** 30 uV/e-
- **Pixel Read Noise:** <25e-
- **Supply Voltage:** 3.0–3.6V (3.3V nominal)
- **Power Consumption:** <160mW @ 60 fps; <120µW standby
- **Operating Temp:** –40°C to +105°C
- **Storage Temp:** –50°C to +125°C
- **Package:** 52-ball iBGA or die, automotive qualified

Block Diagram



Products are warranted only to meet Micron's production data sheet specifications. Products and specifications are subject to change without notice.