



## 2-Megapixel, 1/3.2-Inch CMOS Camera System-on-a-Chip

### Features

- DigitalClarity® CMOS imaging technology
- Ultra low-power, low-cost, progressive scan
- 2-megapixel resolution (1,600H x 1,200V)
- 1/3.2-inch optical format
- 15 frames per second (fps) at full resolution
- 30 frames per second (fps) at 800x600 or smaller
- Integrated auto focus and optical zoom
- Real-time JPEG encoder
- On-chip image flow processor for single-chip camera module
- Numerous automatic functions for on-the-fly image correction and enhancement
- On-chip, 10-bit analog-to-digital converter
- Two-wire serial interface
- Progressive ITU\_R BT.656 (YCbCr), 565RGB, 555RGB, 444RGB, and raw output data formats
- JPEG 4:2:2 and 4:2:0 output

### Bringing High-Performance Video to Low-Cost Home Security Systems

Until the introduction of the MT9D131 security camera, designers were forced to sacrifice performance for cost. With Micron's 2-megapixel camera system-on-a-chip, they have an image sensor to design in to consumer security applications. It outputs full-color digital video at greater-than-VGA resolutions and makes scenes and stills clear enough to enable e-mail or remote viewing.

### Unparalleled CMOS Image Quality

Micron's exclusive DigitalClarity technology dramatically reduces noise levels in our CMOS sensors. While some security cameras generate shots that look like abstract paintings, your MT9D131-equipped camera will deliver sharp, crystal-clear images. Our sensor

provides best-in-class image quality—whether capturing continuous video or single frames—even in extremely low light.

### Sophisticated On-Board Image Processing

Our new CMOS image sensor is a complete, innovative camera system-on-a-chip (SOC). With the MT9D131, designers can simply plug 'n' play—for basic operation, it requires only a power supply, lens, and clock source. Its on-chip image flow processor performs a host of image correcting and enhancing functions you'd normally need another part for, such as color recovery and correction; sharpening; gamma correction; and automatic black level offset correction, exposure, white balance, lens shading, and flicker avoidance.

### Digital Control

The MT9D131, with its 1/3.2-inch optical format and high resolution, enables electronic tilt and pan remote viewing. The entire field of view of the sensor can be scanned to display any one portion at a time—without using a motor or any moving parts. Additionally, because it is fully interpolated, the zoom moves smoothly instead of jumping from 2X to 4X as most digital zoom functions do. Until now, this type of functionality has been out of the reach of regular home owners.

### A Complete System

The camera system features a microcontroller (MCU) and a sophisticated image flow processor (IFP) with a real-time JPEG encoder. The microcontroller manages all components of the camera system and sets



key operation parameters for the sensor core to optimize the quality of raw image data entering the IFP. The sensor core consists of an active pixel array of 1668 x 1248 pixels; programmable timing; control circuitry, including a PLL and analog signal chain with automatic offset correction and programmable gain; and two 10-bit A/D converters (ADCs).

## Contact Micron

Micron's MT9D131 incorporates a number of features and functions to streamline your designs and improve your customers' imaging experiences. To order, call us at +1 208-368-3900 or visit us on the Web at [www.micron.com/imaging](http://www.micron.com/imaging).

## Specifications

|                                 |  |                                 |   |
|---------------------------------|--|---------------------------------|---|
| ● <b>Pixel Size:</b>            | 2.8µm x 2.8µm  | ● <b>ADC:</b>                   | 10-bit, on-chip   |
| ● <b>Array Format (Active):</b> | 1600H x 1200V  | ● <b>JPEG:</b>                  | <ul style="list-style-type: none"> <li>● Sequential DCT (baseline) ISO/IEC 10918-1 JPEG compliant</li> <li>● YCbCr 4:2:2 and 4:2:0 format compression</li> <li>● Support for three pairs of quantization tables—two pairs serve as backup for buffer overflow</li> <li>● Quality: compression ratio control capability</li> </ul> |
| ● <b>Imaging Area:</b>          | 4.73mm x 3.52mm  | ● <b>Auto Focus Support:</b>    | Snapshot, continuous or video, locked, focus-free, and manual modes   |
| ● <b>Color Filter Array:</b>    | RGB Bayer color filters  | ● <b>Responsivity:</b>          | 1.0 V/lux-sec (550nm)   |
| ● <b>Optical Format:</b>        | 1/3.2 inch   | ● <b>Master Clock:</b>          | 6 MHz–80 MHz (integrated PLL)   |
| ● <b>Frame Rates:</b>           | 15 fps (1600 x 1200) and 30 fps (800 x 600)  | ● <b>Signal-to-Noise Ratio:</b> | >41dB (MAX)   |
| ● <b>Scan Mode:</b>             | Progressive  | ● <b>Supply Voltage:</b>        | Digital I/O: 1.7V–3.1V<br>Digital Core: 1.7V–1.95V<br>Analog: 2.5V–3.1V   |
| ● <b>Shutter:</b>               | Electronic rolling shutter (ERS) with global reset   | ● <b>Power Consumption:</b>     | <150mW (@ 30 fps)   |
| ● <b>Window Size:</b>           | Programmable to any size equal to or less than 2-megapixel   | ● <b>Operating Temp:</b>        | –30°C to +70°C  |
| ● <b>Pixel Binning:</b>         | 2 x 2  | ● <b>Shipping Options:</b>      | 48-pin CLCC, Die, iCSP  |
| ● <b>Automatic Functions:</b>   | Exposure, white balance, black level offset correction, flicker detection and avoidance, color saturation control, defect identification and correction, aperture correction, focus    |                                 |   |
| ● <b>Other Controls:</b>        | Exposure, white balance, horizontal blanking, vertical blanking, color, sharpness, contrast, gamma, lens shading correction, left-right and top-bottom image reversal, zoom, windowing |                                 |   |

[www.micron.com](http://www.micron.com)

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