



1/2.3-Inch 10Mp CMOS Digital Image Sensor

MT9J001

For the latest data sheet, refer to Aptina Imaging's Web site: www.aplina.com

Features

- DigitalClarity[®] CMOS imaging technology
- Simple two-wire serial interface
- Auto black level calibration
- Support for external mechanical shutter
- Support for external LED or xenon flash
- High frame rate preview mode with arbitrary down-size scaling from maximum resolution
- Programmable controls: gain, horizontal and vertical blanking, auto black level offset correction, frame size/rate, exposure, left-right and top-bottom image reversal, window size, and panning
- Data interfaces: parallel or four-lane serial high-speed pixel interface (HiSPi[™]) differential signalling (sub-LVDS)
- On-die phase-locked loop (PLL) oscillator
- Bayer pattern downsize scaler
- Integrated position-based color and lens shading correction
- One-time programmable (OTP) memory for storing module information

Applications

- Digital video cameras
- Digital still cameras

General Description

The Aptina Imaging MT9J001 is a 1/2.3-inch CMOS active-pixel digital imaging sensor with an active pixel array of 3856H x 2764V including border pixels. It can support 10 megapixel (3664H x 2748V) digital still images and a 1080p (3840H x 2160V) digital video mode. It incorporates sophisticated on-chip camera functions such as windowing, mirroring, column and row skip modes, and snapshot mode. It is programmable through a simple two-wire serial interface and has very low power consumption.

Ordering Information

Table 1: Available Part Numbers

Part Number	Description
MT9J001I12STCV	HiSPi 48-pin iLCC
MT9J001D12STCV C2CBC1	HiSPi Bare Die
MT9J001I12STCU	Parallel 48-pin iLCC
MT9J001D12STCU C2CBC1	Parallel Bare die

Table 2: Key Performance Parameters

Parameter	Value	
Optical format	1/2.3-inch (4:3)	
Active imager size	6.440mm(H) x 4.616mm (V), 7.923mm diagonal (Entire sensor)	
	6.119mm(H) x 4.589mm (V), 7.649mm diagonal (Still mode)	
	6.413mm(H) x 3.607mm (V), 7.358mm diagonal (Video mode)	
Active pixels	3856H x 2764V (Entire sensor)	
	3664H x 2748V (4:3, Still mode)	
	3840H x 2160V (16:9, Video mode)	
Pixel size	1.67 x 1.67 μ m	
Chief ray angle	0°	
Color filter array	RGB Bayer pattern	
Shutter type	Electronic rolling shutter (ERS) with global reset release (GRR)	
Input clock frequency	6–48 MHz	
Maximum data rate	Parallel	80 Mp/s at 80 MHz PIXCLK
	HiSPi (4-lane)	2.8Gbps
Frame rate	Still mode, 4:3 (3664H x 2748V)	Programmable up to 15 fps serial I/F, 7.5 fps parallel I/F
	Preview mode VGA	30 fps with binning 60 fps with skip2bin2
	1080p mode (1920H x 1080V)	60 fps using HiSPi I/F 30 fps using parallel I/F
ADC resolution	12-bit, on-die	
Responsivity	0.34 V/lux-sec (550nm)	
Dynamic range	66.5dB	
SNR _{MAX}	34dB	
Supply voltage	I/O Digital	1.7–1.9V (1.8V nominal) or 2.4–3.1V (2.8V nominal)
	Digital	1.7–1.9V (1.8V nominal)
	Analog	2.4–3.1V (2.8V nominal)
Power Consumption	Full resolution	600mW
	Preview	200mW low power VGA
	Standby	500 μ W (typical, EXTCLK disabled)
Package	48-pin iLCC (10mm x 10mm) Bare die	
Operating temperature	–30°C to +70°C (at junction)	