

AT76C401

DUAL MODE CMOS INTEGRATED COLOR IMAGER

An integrated CMOS imaging solution for low-cost digital cameras, image capture elements on mobile phones and Web-enabled appliances

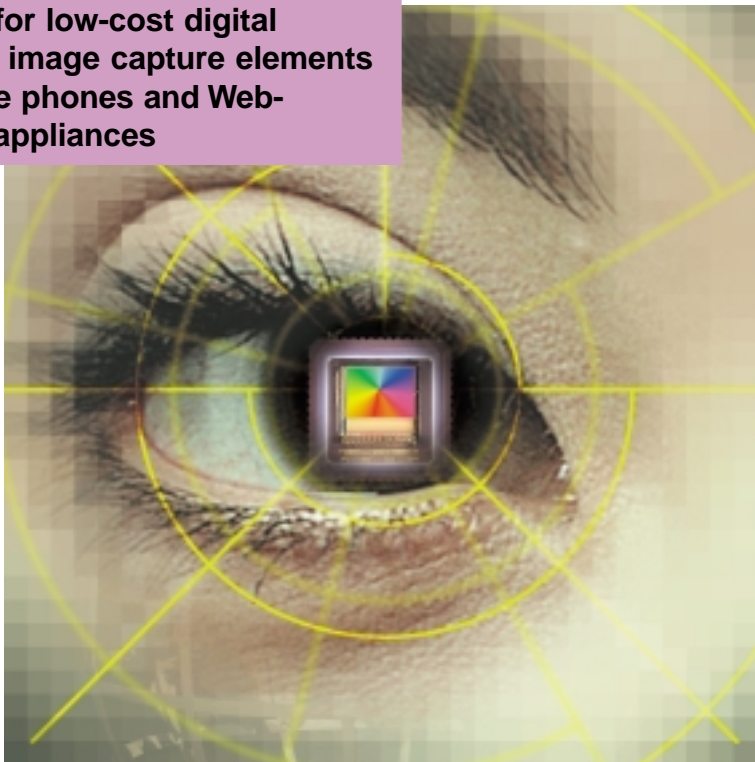
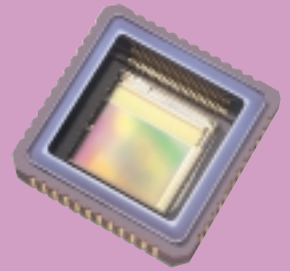


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- Integrated image sensor, CCD quality on low-cost CMOS
- Ideal for low-cost digital cameras, image capture elements on mobile phones and Web-enabled appliances
- 1281 x 480 pixel array
- Active pixel structure, random pixel addressing
- RGB standard output, dual resolution readout, low sensitivity to signal timing
- Non-destructive read, integrated readout control
- Color balance, fixed pattern noise removal via correlated double sampling (CDS)
- Glueless microprocessor interface
- Integral ADC, no analog I/O required
- Single 3.3V voltage rail, flexible power control
- Low interconnect wiring costs
- Easy handling; standard CMOS precautions for Electro-static discharge (ESD) and soldering



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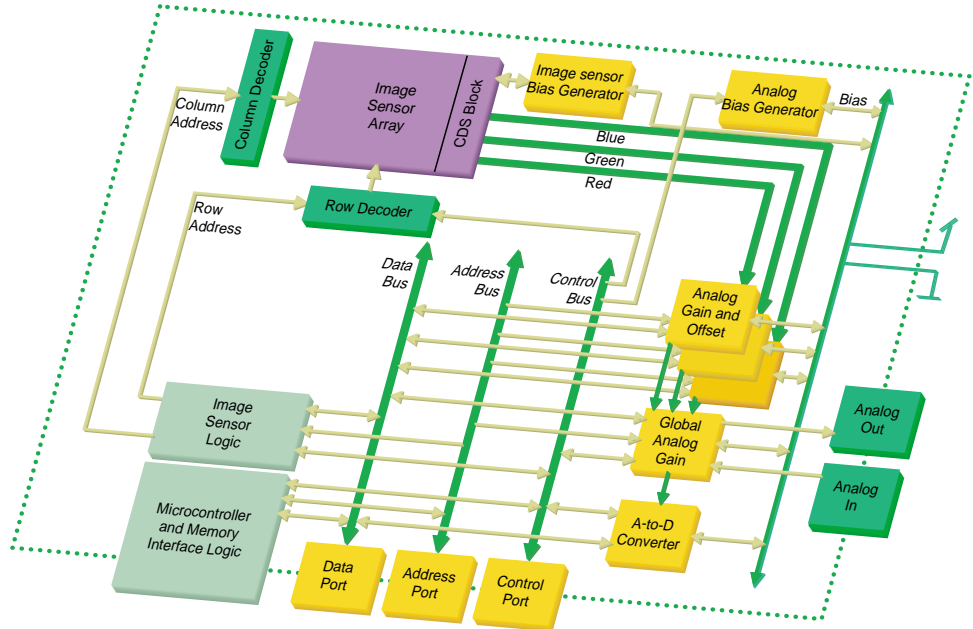


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The Atmel AT76C401 CMOS imager is a single-chip solution jointly developed with Polaroid Corporation. The device combines Atmel's design expertise with Polaroid's patented technology for pixel sensing, color filter processing and color recovery signal processing. It integrates all functions to capture and digitize color images and is suitable for a variety of imaging applications, including digital cameras, for the general market.



AT76C401 Block Diagram

A CMOS imager system on a par with CCD...

The AT76C401 is designed to give significant cost reduction benefits to the system integrator while retaining an image quality on a par with that of charge-coupled device (CCD) imagers in terms of resolution and color rendition.

The pixel density of 1281 (horizontal) x 480 (vertical) and Polaroid's patented color interpolation algorithm gives a captured image roughly equivalent to twice VGA. For the same color resolution, an equivalent CCD imager using a standard complementary color mosaic filter would be specified as approximately 1024 x 768.

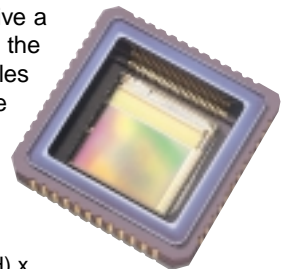
... but with a fraction of the total production cost!

The AT76C401 integrates color image sensors with analog signal conditioning and digital control circuitry. The use of industry standard CMOS enables an unprecedented level of integration of the processing devices, giving a significant reduction in overall system costs.

Unique Flexibility

A single 3.3V rail supply is all that is required and standard microprocessor-accuracy timing is used. There are no negative substrates to generate and no need to conform to complex analog timing

waveforms. The timing insensitivity of the active pixels and the integrated pixel or image addressing give a unique flexibility in selecting the region of interest. This enables simple digital zoom or image pre-sampling for level optimization or focus control.



Shortform Specification

Array:	1305 (H) x 490 (V) pixels
Pixel size:	6 micron x 12 micron
Dark cells:	21(H) x 9 (V)
Total pixels:	640K (approx.)
Effective pixels:	615K (approx.)
Data:	10-bit width RGB sequential
Data rate:	10M pixels/second
Exposure time:	2 µs to 1s
Global gain:	1x to 8x in 4 steps
Individual color gain:	1x to 2.5x in 32 steps
Individual color offset:	46 dB in 256 steps
Temporal noise:	0.1% of full well
Fixed pattern noise:	0.2%
Dynamic range:	> 60 dB
Blooming protection:	> 40 dB
Voltage supply:	3.3V +/- 10%
Package:	44-pin ceramic LCC or bare die
Temperature range:	-20°C to 50°C
Optical size:	9.5 mm (approx.)