

Typical Applications

- Cellular phones
- PDAs
- Laptop computers
- Toys



Features

VGA CMOS Image Sensor - IM-001 Series

- Industry's lowest power dissipation: 15mW at 30 frames per second
- Autobrite™ captures details in both very bright and dim regions, just as human eyes do
- Wide dynamic range: up to 120dB; 500 times better than standard CMOS or CCD sensors
- Low fixed-pattern noise
- VGA resolution: 642 x 482 pixels
- Variable frame rate: up to 60 fps
- Available in color or monochrome



ASIC

- Low power dissipation
- Serves as controller for SmaL's IM-001 Image Sensor
- Complete integrated functions for digital still application
- USB transceiver interface
- I/O interface to external memory, including SRAM, EEPROM, Flash, and SD/MMC cards
- USB to SD conversion
- Internal voltage regulator to operate chip from a wide supply voltage range
- Separate regulated voltage supply for the image sensor
- Lithium polymer battery charger via USB
- Low-power embedded microprocessor
- Internal boot ROM
- Multiple power modes; automatic power down when not in use



Lithium-Polymer Battery

- Ultra-thin: 0.8mm



Digital Imaging Kit

For Low-Power VGA Digital Still Imaging with Autobrite™

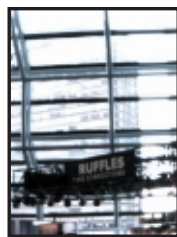
SmaL's Digital Imaging Kit enables qualified OEMs to incorporate high quality digital still imaging into their products by leveraging the industry-leading benefits of SmaL's CMOS VGA image sensor and ASIC.

Industry's lowest power consumption

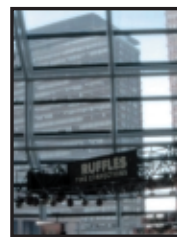
Battery life is one of the biggest concerns among manufacturers and users of portable electronics. SmaL's IM-001 Series VGA CMOS Image Sensor and mixed signal ASIC offer the industry's lowest power digital still imaging solution for cellular phones, PDAs, laptop computers, toys, etc. While standard CMOS image sensors already offer power savings over CCD sensors, SmaL's sensor requires 5 times less power than typical CMOS sensors. Using its kit, SmaL designed and developed the 6mm thin, credit card-size Ultra-Pocket™ digital still camera, which was awarded "Best of CES" 2001 and named by Guinness World Records™ 2002 as the world's "thinnest camera ever". By offering the kit for other applications, SmaL invites OEMs to go beyond what has been possible in the past. Where can your imagination take you?

Autobrite™: Capture an image the way your eyes see it

By extending a scene's dynamic range up to 500 times better than conventional cameras, SmaL's proprietary Autobrite™ on-chip CMOS technology captures an image the way your eyes see it – regardless of extreme variations of brightness within the same scene. SmaL's IM-001 Series VGA Image Sensor provides up to 120 dB dynamic range in order to capture quality images of scenes that are bright enough to saturate other standard CMOS or CCD imagers.



Conventional Digital



SmaL's Autobrite™

The image on the left demonstrates a conventional digital camera's inability to capture details in both very bright and dim regions. The image on the right was captured with Autobrite™ technology, which lets you see the whole picture.

SmaL's kit is application-dependent

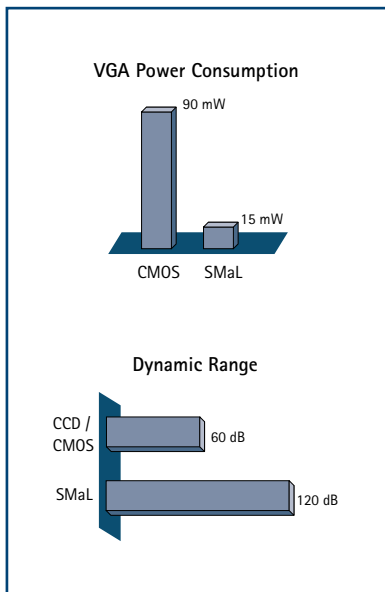
Depending on each OEM's needs and application, SmaL can provide a full or partial kit. In addition to its developer board to jump-start the development process, SmaL also has offerings available for lithium polymer batteries, thin profile optics, and retractable optics.

VGA CMOS Image Sensor / IM-001 Series

Preliminary Specifications

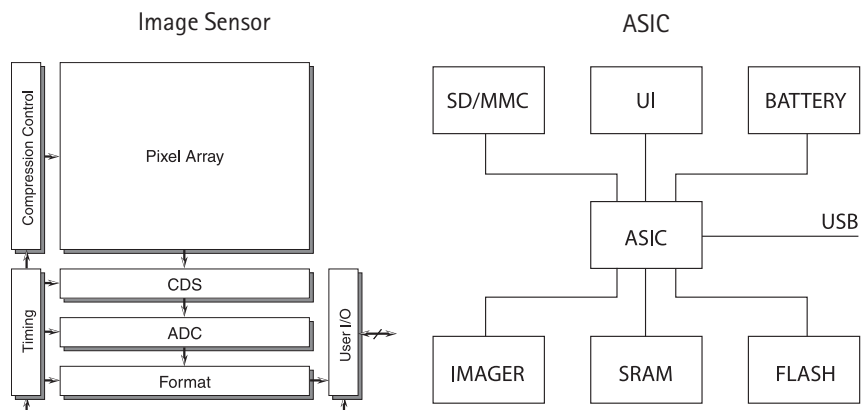


These unaltered images demonstrate Autobrite's unparalleled ability to adapt to varying levels of brightness and produce a great shot every time.



Model Number	IM-001 Series (CMOS Image Sensor)
Active Array Format	642H x 482V
Pixel Size	8.0 μm x 8.0 μm
Pixel Type	Adaptive-dynamic-range photo diode
Sensor Area	5.1 mm x 3.8 mm
Optical Format	1/3 inch
Maximum Frame Rate	60 frames per second
Maximum Data Rate	27 megabytes per second
Power Consumption	30 mW at maximum data rate
Sensitivity	Monochrome: 4.3 V/lux/sec Red: 1.84 V/lux/sec Green: 1.86 V/lux/sec Blue: 1.51 V/lux/sec
Intra-Scene Dynamic Range	Up to 120 dB (depending on adaptive compression setting)
Supply Voltage	3.0 to 3.6 V
Operating Temperature	0° to +70° C
Digital Gain	1x to 16x
Output	8 or 12 bit digital (selectable)
Shutter	Electronic rolling shutter
CDS	On-chip
ADC	On-chip 12-bit column parallel
Package	48-pin LCC Ceramic / Plastic
Timing and Control	On-chip
Programmable Controls	Adaptive compression characteristics Power control Signal gain Exposure parameter

Block Diagrams



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