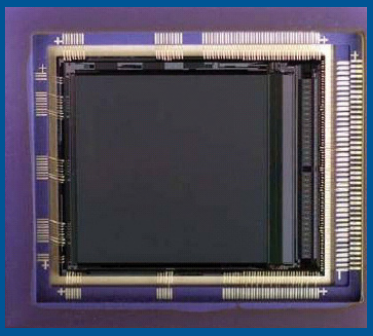
CYPRESS

LUPA 3000
485 FPS, 13.3 Gbit
High Speed Image Sensor



PRODUCT OVERVIEW

DESCRIPTION

The LUPA 3000 is a high speed CMOS image sensor with an image resolution of 1696 x 1710 pixels. The pixels are 8 µm x 8 µm in size and consist of high sensitivity 6T pipelined snapshot shutter capability, where integration during readout is possible. The LUPA 3000 delivers 8-bit color or monochrome digital images with a 3 MPixel resolution at 485 fps which makes this product ideal for high speed vision machine, intelligent traffic system, and holographic data storage. The LUPA 3000 captures complex high speed events for traditional machine vision applications and various high speed imaging applications.

The sensor contains 64 on-chip 8 bit ADCs operating at 25.75 Msamples/s each, resulting in an aggregate pixel rate of 1.4 Gpix/s. The outputs of the 64 ADCs are multiplexed onto 32 LVDS serial links operating at 412 Mbit/s each resulting in an aggregate data rate of 13.3 Gbit/s.

The 32 data channel LVDS interface allows a very high data rate with a limited number of pins. Each channel runs at 51.5 MSPS pixel rate which results in 485 fps frame rate at full resolution. The LUPA 3000 can achieve higher frame rates by windowing which is programmable over the SPI interface. All required clocks, control, and bias signals are generated on-chip. The incoming high speed clock is divided to generate the different low speed clocks required for the operation of the sensor. The sensor generates all its bias signals from an internal bandgap reference. An on-chip sequencer generates all the required control signals for the image core, the ADCs, and the on-chip digital data processing path. The sequencer settings are stored in registers that can be programmed through the serial command interface. The sequencer supports windowed readout at frame rates up to 10,000 fps.

The LUPA 3000 production package will be housed in a 369-pin ceramic µPGA package and will be available in a monochrome version or Bayer (RGB) patterned color filter array with micro lens in Q409. Contact your local Cypress representative for more information.

FEATURES

- 1696 x 1710 active pixels
- 8 µm x 8 µm square pixels
- 1 inch optical format
- Mono and color with micro lens
- 485 fps frame rate
- 64 on-chip 8-bit ADCs
- 32 LVDS serial outputs
- Random programmable ROI readout
- Pipelined and Triggered snapshot shutter
- Serial to Parallel Interface (SPI)
- Limited supplies: Nominal 2.5V (some supplies require 3.3V)
- 0°C to 60°C operational temperature range
- 369-pin ceramic µPGA package
- Power dissipation: 1.1W

APPLICATIONS

- High speed machine vision
- Holographic data storage
- Motion analysis
- Intelligent traffic system
- Medical imaging

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ORDERING INFORMATION

Ordering Part Number	Description	Package	Status
CYIL1SN3000AA-GZDC	Mono micro lens with Glass (ES Samples)	369 pin µPGA	ES Samples: Nov'09. Production: Dec'09
CYIL1SE3000AA-GZDC	Color micro lens with Glass (ES Samples)	369 pin µPGA	ES Samples: Nov'09. Production: Dec'09
CYIL1SN3000-EVAL	Mono micro-lens demo kit	Demo kit	ES Samples: Nov'09. Production: Dec'09

GENERAL SPECIFICATIONS

Parameter	Specification
Active pixels	1696 (H) x 1710 (V)
Pixel size	8 µm x 8 µm
Pixel type	Pipelined shutter pixel
Data rate	412 Mbps (32 serial LVDS outputs)
Shutter type	Pipelined and Triggered snapshot
Frame rate	485 fps at full frame
Master clock	206 MHz
Windowing (ROI)	Randomly programmable ROI read out. Implemented as scanning of lines or columns from an uploaded position
Read out	Windowed read out
ADC resolution	8-bit, on-chip
Sensitivity	3.81 V/lux.s at 550 nm
Extended dynamic range	Multiple slope (up to 90 dB optical dynamic range)

ELECTRO-OPTICAL SPECIFICATIONS

Parameter	Specification
Conversion gain	39.2 µV/e^-
Full well charge	27000 e^-
Sensitivity	2800 V.m^2/W.s at 600 nm with micro lens
Fill factor	36%
Parasitic light sensitivity	<1/5000
Dark noise	21e^-
QE x FF	37% at 680 nm
FPN	1.7% of V_{SAT}
PRNU	2.2% of V_{SIGNAL}
Dark signal	250 mV/s at 25°C
Power dissipation	1.1W at 485 fps

WORLDWIDE SALES AND DESIGN SUPPORT

Cypress offers standard and customized CMOS image sensors for consumer as well as industrial and professional applications. Consumer applications include fast growing high volume cell phones, digital still cameras as well as automotive applications. Cypress's customized CMOS image sensors are characterized by very high pixel counts, large area, very high frame rates, large dynamic range, and high sensitivity. Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. For more information, please contact imagesensors@cypress.com or log on to www.cypress.com/go/imagesensors.

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