

## LM9628 Color CMOS Image Sensor VGA 30 FPS

### General Description

The LM9628 is a high performance, low power, 1/3" VGA CMOS Active Pixel Sensor capable of capturing color digital still or motion images and converting them to a digital data stream.

In addition to the active pixel array, an on-chip 12 bit A/D converter, fixed pattern noise elimination circuits, a video gain and separate color gain amplifier are provided. Furthermore, an integrated programmable smart timing and control circuit allows the user maximum flexibility in adjusting integration time, active window size, gain and frame rate. Various control, timing and power modes are also provided.

The excellent linear dynamic range of the sensor can be extended to above 100dB by programming a non linear response curve that matches the response of the human eye.

### Features

- Video or snapshot operations
- Programmable pixel clock, inter-frame and inter-line delays.
- Programmable partial or full frame integration
- Programmable gain and individual color gain adjustment
- Horizontal & vertical sub-sampling (2:1 & 4:2)
- Programmable digital video response curve
- Windowing
- External snapshot trigger & event synchronisation signals
- Auto black level compensation
- Flexible digital video read-out supporting programmable:
  - polarity for synchronisation and pixel clock signals
  - leading edge adjustment for horizontal synchronization
- Programmable via 2 wire I<sup>2</sup>C compatible serial interface
- Power on reset & power down mode

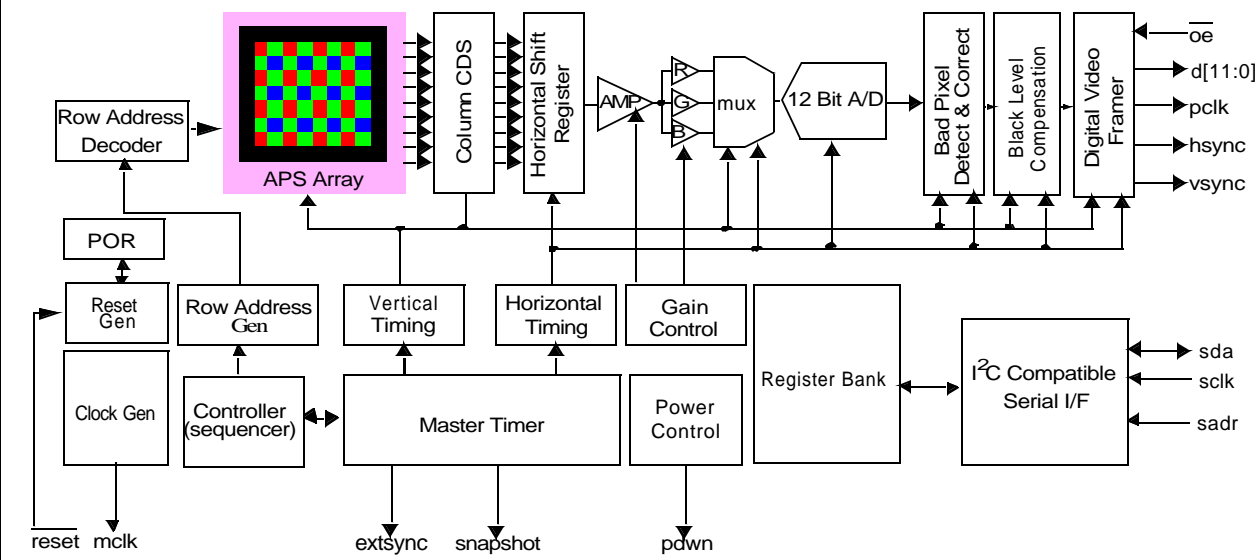
### Applications

- Dual Mode Camera
- Digital Still Camera
- Security Cameras
- Machine Vision
- Automotive

### Key Specifications

Array Format	Total: 664H x 504V Active: 648H x 488V
Effective Image Area	Total: 4.98mm x 3.78mm Active: 4.86mm x 3.66mm
Optical Format	1/3"
Pixel Size	7.5µm x 7.5µm
Video Outputs	8, 10 & 12 Bit Digital
Frame Rate	30 frames per second
Dynamic Range	62dB in linear mode 110dB in non linear mode
Electronic Shutter	Rolling reset
FPN	0.1%
PRMU	1.5%
Sensitivity	2.7 V/lux.s
Quantum Efficiency	27%
Fill Factor	47%
Color Mosaic	Bayer pattern
Package	48 CLCC
Single Supply	3.3 V +/-10%
Power Consumption	120 mW
Operating Temp	-40 to 85°C

### Overall Chip Block Diagram



## Ordering Information (Product, Samples & Design In Tools)

Item	Description	Part Number
LM9628	LM9628, 30 frames per second color CMOS image sensor. This sensor is shipped in a 48 pin ceramic leadless chip carrier package. Minimum order quantity, one tray of 96 units.	LM9628IEA
Sample Kit	This kit includes 5 LM9628 samples and complete product datasheet.	LM9628SAMPLE-KIT
Headboard	This is a small PCB that houses the LM9628 sensor together with all necessary discrete components. The headboard is supplied with C-MOUNT lens block (lens not included) and documentation. M12 Lens mounts (not included) can be mounted on this board.	LM9628HEADBOARD
Evaluation Kit	The evaluation kit is a complete software/hardware solution designed to give the system designer a complete raw data evaluation toolset for the LM9628 sensor.  The kit contains a LM9628 headboard (see above), C-MOUNT lens, capture and display board, power supply, SNAPS EVAL version Windows application software and documentation.	LM9628EVAL-KIT
1/3" Lens Kit	The 1/3" lens kit consists of four 1/3" M12 lenses and an M12 mount that can be attached to any LM9628 headboard (see above). All lenses in the kit have been tested by National Semiconductor and are supplied with documentation and test data.	LM96XXLENS-KIT

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 **National Semiconductor Corporation**  
Americas  
Tel: 1-800-272-9959  
Fax: 1-800-737-7018  
Email: support@nsc.com  
[www.national.com](http://www.national.com)

**National Semiconductor Europe**  
Fax: +49 (0) 1 80-530 85 86  
Email: europe.support@nsc.com  
Deutsch Tel: +49 (0) 69 9508 6208  
English Tel: +44 (0) 870 24 0 2171  
Francais Tel: +33 (0) 1 41 91 8790

**National Semiconductor Asia Pacific Customer Response Group**  
Tel: 65-2544466  
Fax: 65-2504466  
Email: ap.support@nsc.com

**National Semiconductor Japan Ltd.**  
Tel: 81-3-5639-7560  
Fax: 81-3-5639-7507