National Semiconductor

LM9648 Color CMOS Image Sensor SXGA 18 FPS

General Description

The LM9648 is a high performance, low power, 1/2" SXGA CMOS Active Pixel Sensor capable of capturing color still or motion images and converting them to a digital data stream.

Mega-pixel class image quality is achieved by integrating a high performance analog signal processor comprising of a high speed 10 bit A/D convertor, fixed pattern noise elimination circuits and separate color gain amplifiers. The offset and black level can be automatically adjusted on chip using a full loop black level compensation circuit.

Furthermore, a programmable smart timing and control circuit allowing the user maximum flexibility in adjusting integration time, active window size, gain, frame rate. Various control, timing and power modes are also provided.

Features

- Video and snapshot operation
- Progressive scan read out with horizontal and vertical flip
- Programmable Exposure:
  - Master clock divider
  - Inter row delay
  - Inter frame delay
  - Partial frame integration
- Four channels of digitally programmable analog gain
- Full automatic servo loop for black level & offset adjustment on each gain channel
- Horizontal & vertical sub-sampling (2:1 & 4:2) with averaging
- Windowing
- Programmable pixel clock, inter-frame and inter-line delays
- I^2C compatible serial control interface
- Power on reset & power down mode

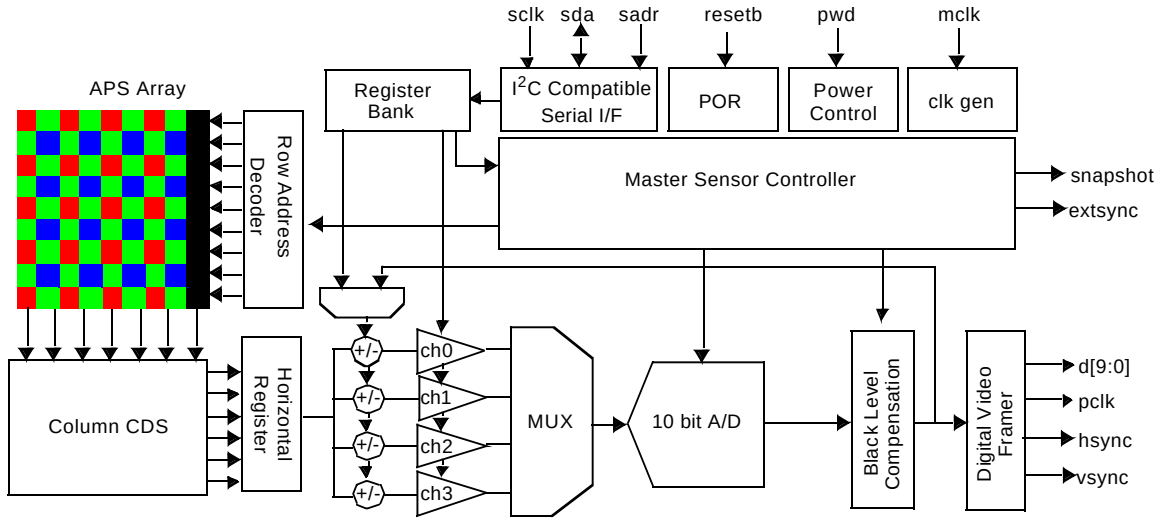
Applications

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

Key Specifications

Array Format	Total: 1032 x 1312 Active: 1032 x 1288
Effective Image Area	Total: 6.30mm x 7.83mm Active: 6.27mm x 7.81mm
Optical Format	1/2"
Pixel Size	6.0µm x 6.0µm
Video Outputs	8 & 10 Bit Digital
Frame Rate	18 frames per second
Dynamic Range	57 dB
Shutter	Rolling reset
FPN	0.5%
PRMU	1.7%
Sensitivity	2.5 volts/lux.s
Fill Factor	49%
Color Mosaic	Bayer pattern
Package	48 LCC
Single Supply	3.0V +/- 10%
Power Consumption	150mW
Operating Temp	-10°C to 50°C

Overall Chip Block Diagram



Ordering Information (Product, Samples & Design In Tools)

Item	Description	Part Number
LM9648	LM9648 SXGA, 18 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.	LM9648CEA
Sample Kit	This kit includes 5 LM9648 samples and complete product datasheet.	LM9648SAMPLE-KIT
Headboard	This is a small PCB that houses the LM9648 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.	LM9648HEADBOARD
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 LM9648 sensor. The kit contains a LM9648 headboard (see above), C-MOUNT lens, capture and display board, power supply, SNAPS EVAL version Windows application software and documentation.	LM9648EVAL-KIT
1/2" Lens Kit	The 1/2" lens kit consists of two 1/2" M12 lenses and an M12 mount that can be attached to any LM9648 headboard (see above). All lenses in the kit have been tested by National Semiconductor and are supplied with documentation and test data.	LM96-1/2-LENS-KIT

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