



CMOS MT9V034 Camera Module

1/3-Inch 0.36MP Monochrome Module Datasheet

Rev 1.0, Mar 2017

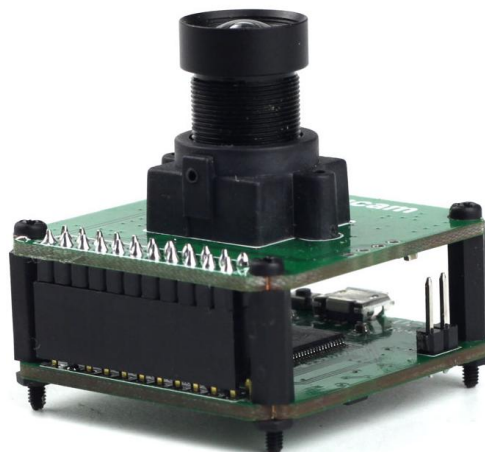


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1 Introduction

The MT9V034 is a 1/3-inch monochrome wide-VGA format CMOS active-pixel digital image sensor with global shutter and high dynamic range (HDR) operation. The sensor has specifically been designed to support the demanding interior and exterior surveillance imaging needs, which makes this part ideal for a wide variety of imaging applications in real world environments.

This wide-VGA CMOS image sensor features ON Semiconductor's break through low-noise CMOS imaging technology that achieves CCD image quality (based on signal-to-noise ratio and low-light sensitivity) while maintaining the inherent size, cost, and integration advantages of CMOS.

The active imaging pixel array is 752H x 480V. It incorporates sophisticated camera functions on-chip—such as binning 2 x 2 and 4 x 4, to improve sensitivity when operating in smaller resolutions—as well as windowing, column and row mirroring. It is programmable through a simple two-wire serial interface.

The MT9V034 can be operated in its default mode or be programmed for frame size, exposure, gain setting, and other parameters. The default mode outputs a wide-VGA-size image at 60 frames per second (fps).

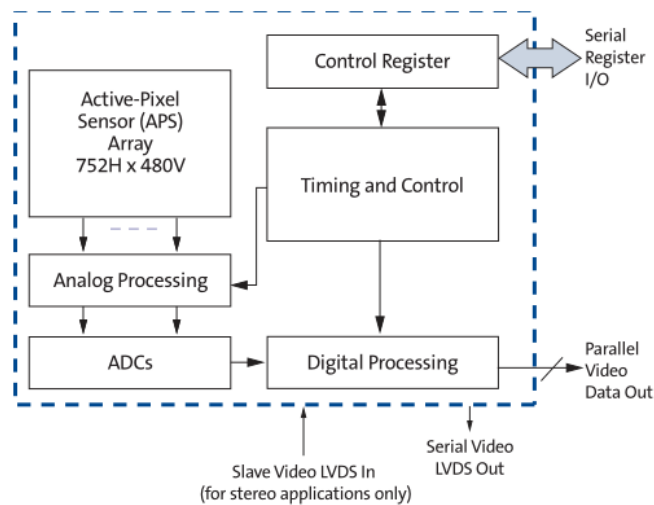
An on-chip analog-to-digital converter (ADC) provides 10 bits per pixel. A 12-bit resolution compounded for 10 bits for small signals can be alternatively enabled, allowing more accurate digitization for darker areas in the image.

In addition to a traditional, parallel logic output the MT9V034 also features a serial low-voltage differential signaling (LVDS) output. The sensor can be operated in a stereo-camera, and the sensor, designated as a stereo-master, is able to merge the data from itself and the stereo-slave sensor into one serial LVDS stream.

2 Features

Parameter	Value
Optical format	1/3-inch
Active imager size	4.51mm(H) x 2.88mm(V) 5.35mm diagonal
Active pixels	752H x 480V
Pixel size	6.0µm x 6.0µm
Color filter array	Monochrome or color RGB Bayer
Shutter type	Global shutter
Maximum data rate master clock	27 Mp/s 27 MHz
Full resolution	752 x 480
Frame rate	60 fps (at full resolution)
ADC resolution	10-bit column-parallel
Responsivity	4.8 V/lux-sec (550nm)
Dynamic range	>55dB linear; >100dB in HDR mode
Supply voltage	3.3V ±0.3V (all supplies)
Power consumption	<160mW at maximum data rate (LVDS disabled); 120µW standby power at 3.3V
Operating temperature	-30°C to +70°C ambient
Packaging	48-pin CLCC

3 Block Diagram



4 Application

- Security
- High dynamic range imaging
- Unattended surveillance
- Stereo vision
- Video as input
- Machine vision
- Automation

5 Pin Definition

The MT9V034 module uses standard ArduCAM camera pin out. The pin number is listed as below.

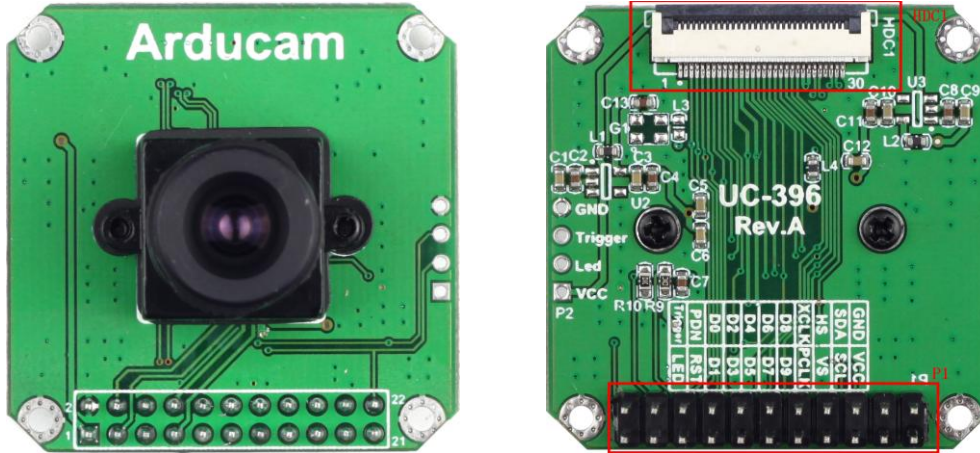


Table 1 P1 Connector Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	VCC	POWER	3.3v Power supply
2	GND	Ground	Power ground
3	SCL	Input	Two-Wire Serial Interface Clock
4	SDA(SDATA)	Bi-directional	Two-Wire Serial Interface Data I/O
5	VS(VSYNC)	Output	Active High: Frame Valid; indicates active frame
6	HS(HREF)	Output	Active High: Line/Data Valid; indicates active pixels
7	PCLK	Output	Pixel Clock output from sensor
8	XCLK	Input	Master Clock into Sensor
9	D9(DOUT9)	Output	Pixel Data Output 9 (MSB)
10	D8(DOUT8)	Output	Pixel Data Output 8
11	D7(DOUT7)	Output	Pixel Data Output 7
12	D6(DOUT6)	Output	Pixel Data Output 6
13	D5(DOUT5)	Output	Pixel Data Output 5
14	D4(DOUT4)	Output	Pixel Data Output 4
15	D3(DOUT3)	Output	Pixel Data Output 3
16	D2(DOUT2)	Output	Pixel Data Output 2(LSB)
17	D1(DOUT1)	Output	Pixel Data Output 1(10bit mode)
18	D0(DOUT0)	Output	Pixel Data Output 0(10bit mode)
19	RST	Input	Sensor reset signal, active low
20	PDN(PWDN)	Input	Power down input, active high
21	LED(LED_OUT)	Output	LED strobe output
22	Trigger(EXP)	Input	Rising edge starts exposure in snapshot and slave modes

Table 2 HDC1 Connector Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	VCC	POWER	3.3v Power supply
2	VCC	POWER	3.3v Power supply
3	D0(DOUT0)	Output	Pixel Data Output 0(10bit mode)
4	D1(DOUT1)	Output	Pixel Data Output 1(10bit mode)
5	D2(DOUT2)	Output	Pixel Data Output 2(LSB)
6	D3(DOUT3)	Output	Pixel Data Output 3
7	D4(DOUT4)	Output	Pixel Data Output 4
8	PDN(PWDN)	Input	Power down input, active high
9	RST	Input	Sensor reset signal, active low
10	LED(LED_OUT)	Output	LED strobe output
11	PCLK	Output	Pixel Clock output from sensor
12	XCLK	Input	Master Clock into Sensor
13	SCL	Input	Two-Wire Serial Interface Clock
14	SDA(SDATA)	Bi-directional	Two-Wire Serial Interface Data I/O
15	Trigger(EXP)	Input	Rising edge starts exposure in snapshot and slave modes
16	VS(VSYNC)	Output	Active High: Frame Valid; indicates active frame
17	HS(HREF)	Output	Active High: Line/Data Valid; indicates active pixels
18	D5(DOUT5)	Output	Pixel Data Output 5
19	D6(DOUT6)	Output	Pixel Data Output 6
20	D7(DOUT7)	Output	Pixel Data Output 7
21	D8(DOUT8)	Output	Pixel Data Output 8
22	D9(DOUT9)	Output	Pixel Data Output 9 (MSB)
23	GND	Ground	Power ground
24	GND	Ground	Power ground
25	CLKOUT_N	Output	Output shift CLK (differential negative)
26	CLKOUT_P	Output	Output shift CLK (differential positive)
27	GND	Ground	Power ground
28	DATAOUT_P	Output	Serial data out (differential positive)
29	DATAOUT_N	Output	Serial data out (differential negative)
30	GND	Ground	Power ground

