CMOS OV2640 Camera Module

1/4-Inch 2-Megapixel Module Datasheet

Rev 1.0, May. 2015

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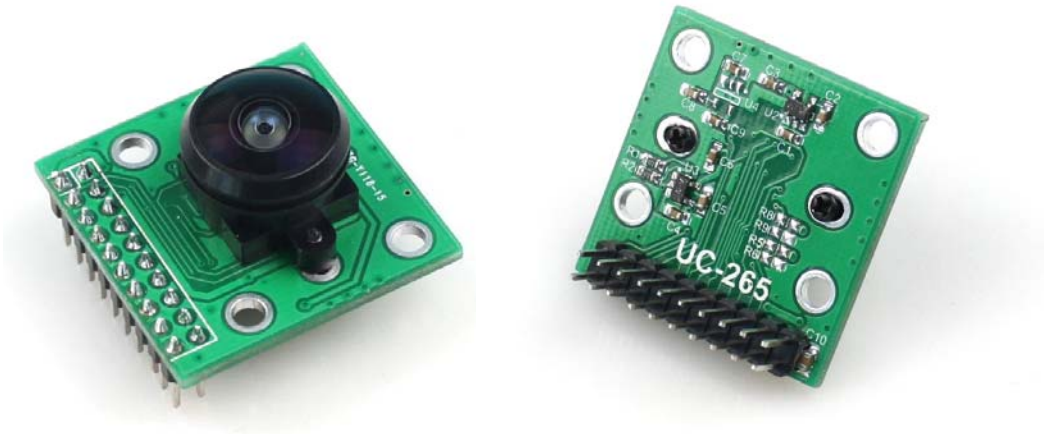
1 Introduction

ArduCAM team now released a M12 mount camera module with OV2640 image sensor from Omnivision. With the benefit of M12 mount lens holder, user can change different lenses like wide angle lenses according to their application. Also the camera module provide a ArduCAM standard pin outs with 0.1”(2.54mm) pin pitch, user can change different modules while keep the pin outs the same.

The OV2640 CAMERACHIP™ image sensor is a low voltage CMOS device that provides the full functionality of a single-chip UXGA (1632x1232) camera and image processor in a small footprint package. The OV2640 provides full-frame, sub-sampled, scaled or windowed 8-bit/10-bit images in a wide range of formats, controlled through the Serial Camera Control Bus (SCCB) interface. This product has an image array capable of operating at up to 15 frames per second (fps) in UXGA resolution with complete user control over image quality, formatting and output data transfer. All required image processing functions, including exposure control, gamma, white balance, color saturation, hue control, white pixel canceling, noise canceling, and more, are also programmable through the SCCB interface. The OV2640 also includes a compression engine for increased processing power. In addition, OmniVision CAMERACHIP sensors use proprietary sensor technology to improve image quality by reducing or eliminating common lighting/electrical sources of image contamination, such as fixed pattern noise, smearing, etc., to produce a clean, fully stable color image.



2 Features

- M12 mount lens holder, more lens options
- 1/4” sensor size
- High sensitivity for low-light operation
- Standard SCCB interface
- Output support for Raw RGB, RGB (RGB565/555), GRB422, YUV (422/420) and YCbCr (4:2:2) formats, JPEG compression formats
- Supports image sizes: UXGA, SXGA, SVGA, and any size scaling down from SXGA to 40x30
- Automatic image control functions including Automatic Exposure Control (AEC), Automatic Gain Control (AGC), Automatic White Balance (AWB), Automatic Band Filter (ABF), and Automatic Black-Level Calibration (ABLC)
- Image quality controls including color saturation, gamma, sharpness (edge enhancement), lens correction, white pixel canceling, noise canceling, and 50/60 Hz luminance detection
- Low operating voltage for embedded portable apps
- Board Size: 30.5x30.5mm

3 Key Specifications

Array Size	UXGA	1600 x 1200
Power Supply	Core	1.3VDC ± 5%
	Analog	2.5 ~ 3.0VDC
	I/O	1.7V to 3.3V
Power Requirements	Active	125 mW (for 15 fps, UXGA YUV mode)
		140 mW (for 15 fps, UXGA compressed mode)
	Standby	900 µA
Temperature Range	Stable Image	0°C to 50°C
Output Formats (8-bit)		• YUV(422/420)/YCbCr422 • RGB565/555 • 8-bit compressed data • 8-/10-bit Raw RGB data
Lens Size		1/4"
Chief Ray Angle		25° non-linear
Maximum Image Transfer Rate	UXGA/SXGA	15 fps
	SVGA	30 fps
	CIF	60 fps
Sensitivity		0.6 V/Lux-sec
S/N Ratio		40 dB
Dynamic Range		50 dB
Scan Mode		Progressive
Maximum Exposure Interval		1247 x t_{ROW}
Gamma Correction		Programmable
Pixel Size		2.2 µm x 2.2 µm
Dark Current		15 mV/s at 60°C
Well Capacity		12 Ke
Fixed Pattern Noise		<1% of $V_{PEAK-TO-PEAK}$
Image Area		3590 µm x 2684 µm
Package Dimensions		5725 µm x 6285 µm

4 Application

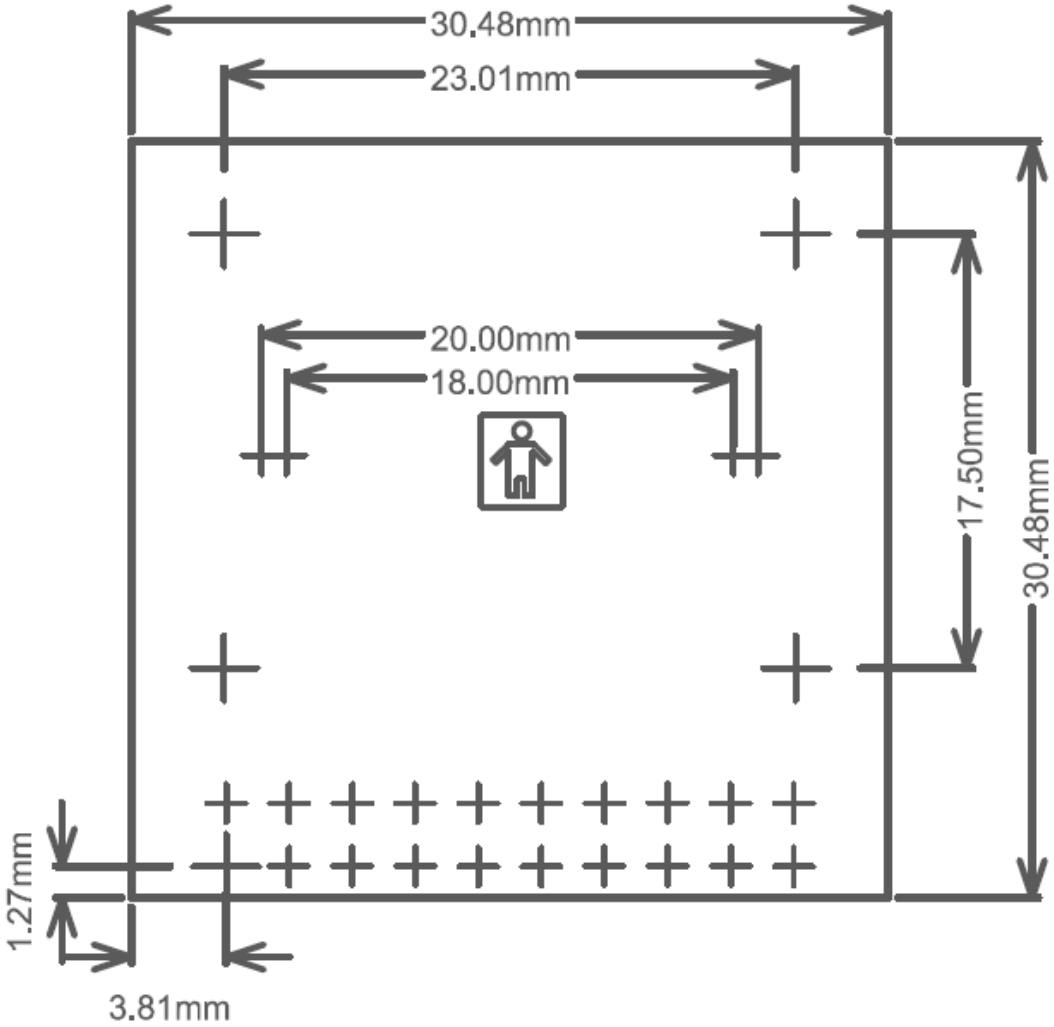
- Cellular phones
- PDAs
- Toys
- Other battery-powered products
- Can be used in Arduino, Maple, ChipKit, STM32, ARM, DSP, FPGA platforms

5 Pin Definition

ArduCAM Standard 0.1 inch pin pitch package pin out

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	SDATA	Bi-directional	Two-Wire Serial Interface Data I/O
5	VSYNC	Output	Active High: Frame Valid; indicates active frame
6	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	DOUT9	Output	Pixel Data Output 9 (MSB)
10	DOUT8	Output	Pixel Data Output 8
11	DOUT7	Output	Pixel Data Output 7
12	DOUT6	Output	Pixel Data Output 6
13	DOUT5	Output	Pixel Data Output 5
14	DOUT4	Output	Pixel Data Output 4
15	DOUT3	Output	Pixel Data Output 3
16	DOUT2	Output	Pixel Data Output 2 (LSB)
17	DOUT1	Output	Pixel Data Output 1(10bit mode)
18	DOUT0	Output	Pixel Data Output 0 (10bit mode)
19	RST	Input	Camera reset, active low
20	PWDN	Input	Camera power down, active high

6 Dimension



7 Lens Specification

Basically the user can select the lens according to their own application, for lens option please contact admin@arducam.com for detail.

PRODUCT NAME: LS- 40180

1. SPECIFICATION :

1.SENSOR SIZE	1/4"
2.WAVELENGTH	λ= 400-700nm(COLOR)
3.FOCAL LENGTH (EFL)	f= 1.05 mm
4.F/NO (INFINITE)	F/NO= 2.0
5.BACK FOCAL LENGTH	BFL= 1.88 mm
6.FLANGE BACK LENGTH	FB= 1.48 mm
7.FIELD OF VIEW (DIAGONAL)	= 206°
H	194°
V	142°
8.OPTICAL DISTORTION (DIAGONAL)	< -81%
9.Thread Size	M12XP0.5-6g
10.Element	4G
11.WATERPROOF	IP67

2. OPTICAL LAYOUT :

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