Arducam USB3 Camera Shield
Data Sheet

Rev 1.0, May 2018

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1 Introduction

Arducam series USB camera shield is a general purpose USB camera control board for PC and embedded signal board computer. It hides the complex nature of the camera and provides the plug and play camera control interface as well as the ready to use SDK library and demo software source code. The Arducam supports variety camera modules from 0.3MP to 14MP or even higher.

Arducam USB3 camera shield is the latest USB3.0 camera shields, it offers the improved performance and enhanced functions than the previous USB2.0 camera shield. It not only supports high resolution and high frame rate image sensors, but also supports stereoscopy camera and IRCUT control feature. With the given camera configuration files, user can switch between different cameras without any effort. It is the ideal solution for camera evaluation/testing, robot/drone, IoT, machine vision and scientific applications.

Figure 1 Arducam USB3 Camera Shield

2 Application

- IoT cameras
- Robot cameras
- Wildlife cameras
- Machine vision
- Scientific cameras

3 Features

- Support any parallel image sensors (need proper register settings)
- Support 8/10/12/14/16 bit pixel color depth
- Support Stereoscopy mode for dual camera system
- Build-in IRCUT control
- Need extra MIPI to parallel adapter board for supporting MIPI interface sensors (see Table1)
- Provide free binary SDK library and demo software source code, please visit github.org/Arducam
- Fully customizable and can be ported to any hardware platform and software OS

Table 1 Featured Camera Modules Supported

Resolution	Frame Rate	Camera Module	Sensor Vendor
0.3MP	100fps	OV7251 (MIPI)	Omnivision
0.3MP	60fps	MT9V022/MT9V034	Aptina
1.3MP	50fps	AR0134/AR0135	Aptina
5MP	15fps	OV5647 (MIPI)	Omnivision
9MP	7fps	MT9N001	Aptina
10MP	6fps	MT9J001/MT9J003	Aptina
14MP	5fps	MT9F002	Aptina
13MP	5fps	OV13850 (MIPI)	Omnivision

4 Key Specifications

- Bandwidth: 5-Gbps USB3.0 PHY
- Camera Databus: 16bit@100MHz
- I/O Voltage Standard: 3.3V
- Connector: Micro-USB3.0
- Size: 40 x 40 mm
- Weight: 10g
- Power Consumption: 5V/300mA
- Operation Temperature: -10℃～+55℃(Consumer default), -40℃～+85℃(Industrial)

5 Pin Definition

Figure 2 shows the connectors of the USB3 camera shield. There are one Micro-USB3.0 connector which can be connected to USB3.0 host controller, and one connector for motorized IR-Cut filter for both daylight and night vision. There are two camera interface on the bottom of the board, one for 8bit camera data bus and the other for 16bit camera data bus. The pin out definition see Table 2 and Table 3.

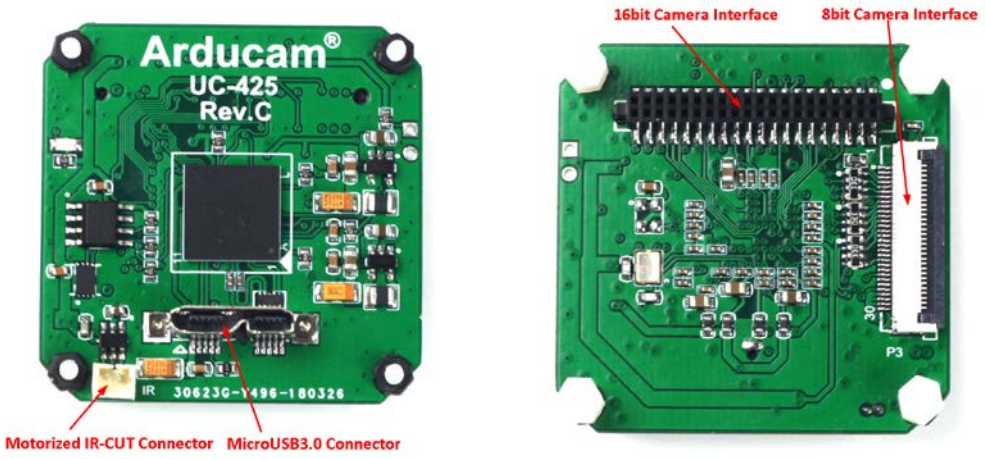

Figure 2 Interface Diagram

Table 2 8-bit Camera Interface Pin Definition
(Connector Part Number: Hirose FH28D-30S-0.5SH(05))

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	GND	Ground	Power ground
2	Reserved	NC	
3	Reserved	NC	
4	VSYNC	Input	Active High: Frame Valid; indicates active frame
5	HREF	Input	Active High: Line/Data Valid; indicates active pixels
6	DOUT11	Input	Camera Pixel Data Input 11 (MSB)
7	DOUT10	Input	Camera Pixel Data Input 10
8	DOUT9	Input	Camera Pixel Data Input 9
9	DOUT8	Input	Camera Pixel Data Input 8
10	DOUT7	Input	Camera Pixel Data Input 7
11	DOUT6	Input	Camera Pixel Data Input 6
12	DOUT5	Input	Camera Pixel Data Input 5
13	GND	Ground	Power ground
14	DOUT4	Input	Camera Pixel Data Input 4 (LSB)
15	DOUT3	Input	Camera Pixel Data Input 3 (Unconnected)
16	DOUT2	Input	Camera Pixel Data Input 2 (Unconnected)
17	DOUT1	Input	Camera Pixel Data Input 1 (Unconnected)
18	DOUT0	Input	Camera Pixel Data Input 0 (Unconnected)
19	Reserved	NC	

20	PCLK	Input	Pixel Clock output from Camera
21	SCL	Output	Two-Wire Serial Interface Clock
22	SDATA	Bi-directional	Two-Wire Serial Interface Data I/O
23	RST	Output	Sensor reset signal, active low
24	GND	Ground	Power ground
25	GND	Ground	Power ground
26	STANDBY	Output	Standby-mode enable pin (active HIGH)
27~30	VCC	POWER	3.3v Power supply

Table 3 16-bit Camera Interface Pin Definition

(Connector Part Number: Harwin M50-4302045)

Pin No.	PIN NAME	TYPE	Pin No.	PIN NAME	TYPE
1	VCC3.3	POWER	2	VCC3.3	POWER
3	GND	Ground	4	GND	Ground
5	SDATA	Bi-directional	6	SCL	Input
7	Data10	Input	8	Data12	Input
9	Data11	Input	10	Data13	Input
11	Data8	Input	12	Data6	Input
13	Data3	Input	14	Data0	Input
15	RST	Output	16	Data4	Input
17	Data7	Input	18	Data9	Input
19	Reserved	NC	20	STANDBY	Output
21	Reserved	NC	22	Reserved	NC
23	Data14	Input	24	HREF	Input
25	Reserved	NC	26	VSYNC	Input
27	Reserved	NC	28	GND	Ground
29	PCLK	Input	30	GND	Ground
31	Data1	Input	32	Data5	Input
33	Reserved	NC	34	Data15	Input
35	Data2	Input	36	Reserved	NC
37	Reserved	NC	38	Reserved	NC
39	Reserved	NC	40	USB_RST	Input

6 Mechanical Dimension

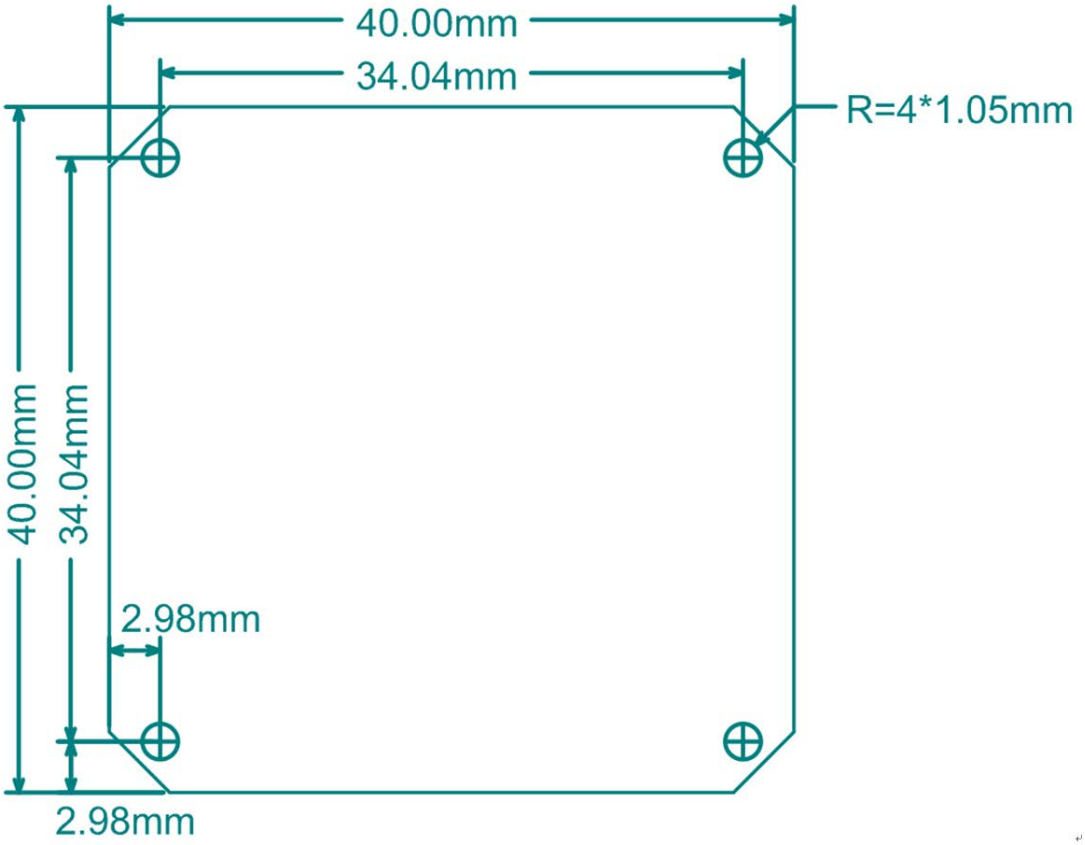

Figure 3 Mechanical Dimension

7 Order Information

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