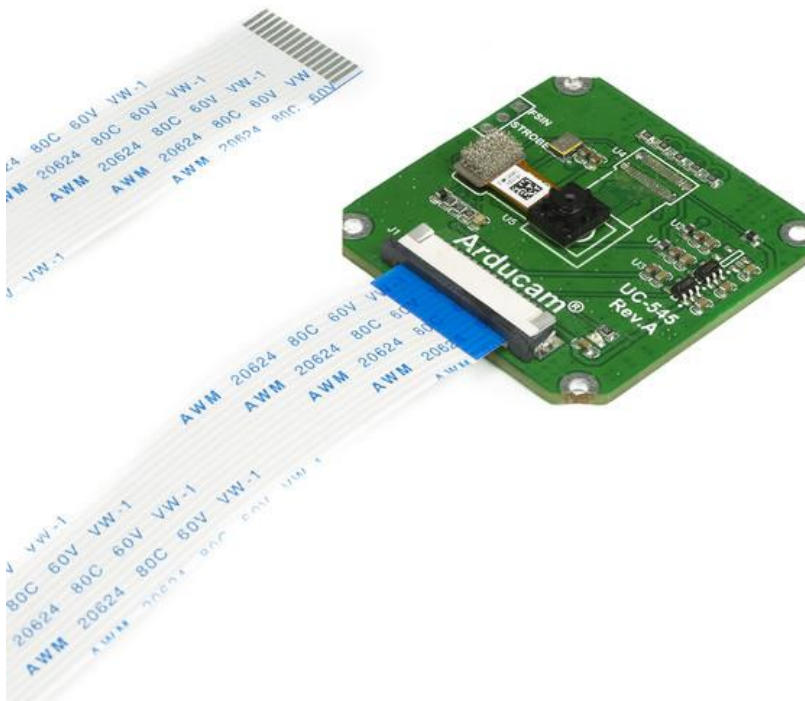




**CMOS OV7251 Camera Module**  
**0.31MP Monochrome Global Shutter Camera**  
**Module Datasheet**

Rev 1.0, NOV 2018



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## 1 Introduction

The OV7251 is a small form factor, low power monochrome (BW) sensor that uses a global shutter to reduce or eliminate unwanted image artifacts, which occur with traditional rolling shutter image sensors as a result of motion during image capture. The sensor's global shutter and excellent low-light sensitivity allow it to be used for any application that has a need for gesture detection, head and eye tracking, and depth and motion detection.

The OV7251's compact form factor makes it a highly attractive camera solution for space-constrained applications such as head-mounted displays, smartphones, tablets, notebooks and Ultrabooks. Likewise, the sensor's low-power consumption makes it an ideal dedicated gesture sensor for similar application areas.

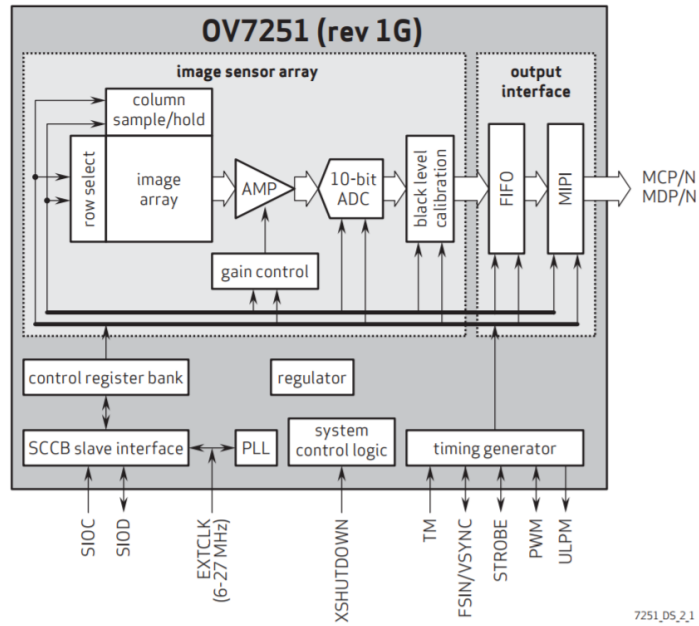
Leveraging the industry's smallest global shutter pixel, the black and white OV7251 is capable of capturing VGA (640x480) resolution video at 120 frames per second (fps), QVGA (320x240) at 180 fps with binning, and QQVGA (160x120) at 360 fps with binning and skipping. The OV7251's high frame rates make it an ideal solution for low-latency machine vision applications.

Arducam team now designed a camera breakout board for fast evaluation of this MIPI interface global shutter camera module, which can be connected to Arducam USB2.0/3.0 camera shield through MIPI to parallel adapter board. The example source code is also available from Arducam's github, user can easily test them on Windows, Linux as well as Raspberry Pi.

## 2 Key Specifications

Parameter		Typical Value
Sensor		Monochrome global shutter OV7251
Pixel Size		3 $\mu\text{m}$ x 3 $\mu\text{m}$
Active array size		640*480
Optical Size		1/7.5 inch
EFL		1.3
F.NO		2.2
FOV		D86.5° /H72.9° /V57.7°
Focusing Range		65mm ~ infinite
Output interface		1-lane MIPI serial output
Output formats		10-bit BW RAW
Maximum image transfer rate		640 x 480: 120 fps
Sensitivity		10,800mV/( $\mu\text{W}\cdot\text{cm}^2\cdot\text{sec}$ ) @ 850nm
Power supply	Analog	2.8v(nominal)
	Core	1.5V (optional)
	I/O	1.8V (nominal)
Power requirements	Active	119 mW @ 120fps, VGA output
Temperature range	Operating	-30° C to 70° C junction temperature
	Stable image	0° C to 50° C junction temperature
Board Size		40mm x 40mm

### 3 Block Diagram



### 4 Application

- Cellular phones
- Toys
- Tablets
- Machine vision
- ARM based platforms

## 5 Pin Definition

The OV7251 module uses standard Raspberry pi camera pin out. The pin number is listed as below. Mating connector is Amphenol FCI SFW15R-1STE1LF or similar.

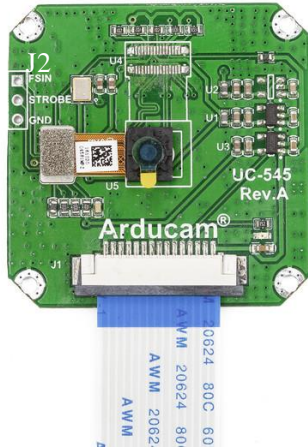


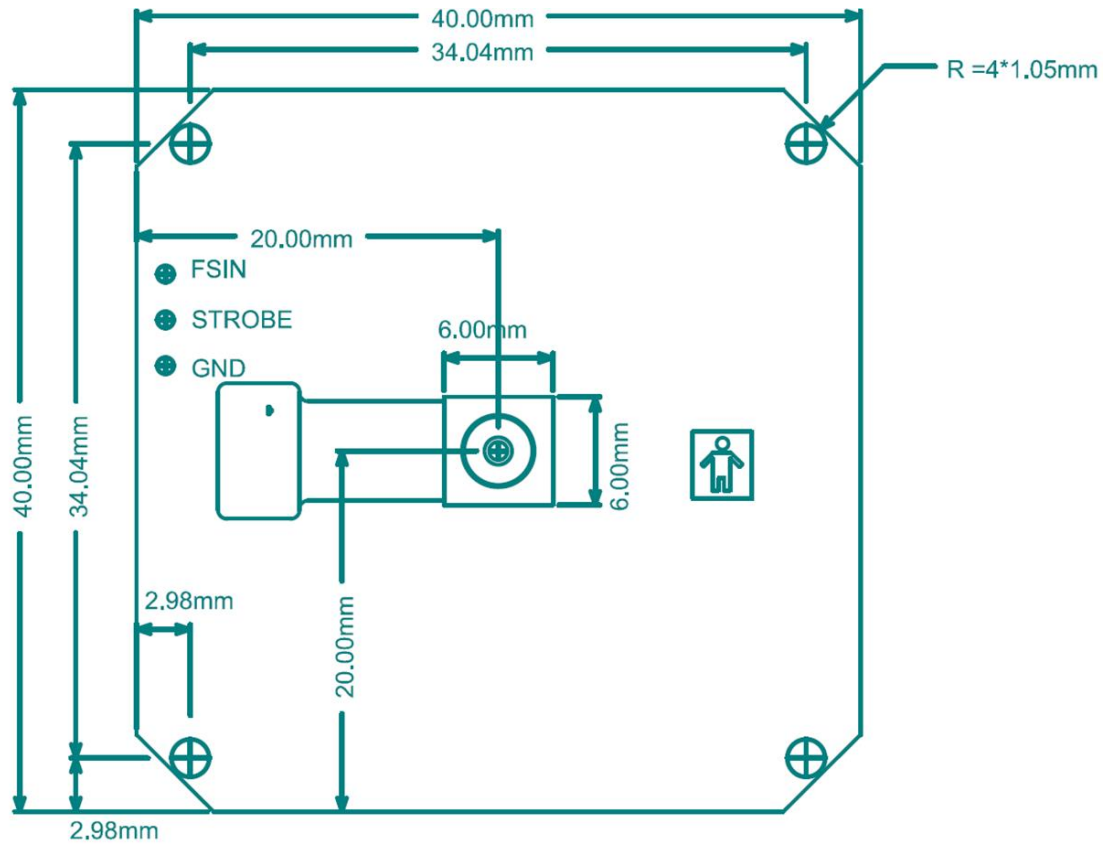
Table 1 J1 Connector Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	DGND	Ground	Power ground
2	MDN0	Output	Pixel Data Lane0 Negative
3	MDP0	Output	Pixel Data Lane0 Positive
4	DGND	Ground	Power ground
5	MDN1	Output	Pixel Data Lane1 Negative
6	MDP1	Output	Pixel Data Lane1 Positive
7	DGND	Ground	Power ground
8	MCN	Output	Pixel Clock Output Form Sensor Negative
9	MCP	Output	Pixel Clock Output Form Sensor Positive
10	DGND	Ground	Power ground
11	POWER-EN	Output	Power Enable
12	LED-EN	I/O	Led Enable
13	SCL	Input	SCCB serial interface clock input
14	SDA	I/O	SCCB serial interface data I/O
15	VCC	Power	3.3V Power supply

Table 1 J2 Connector Pin Definition

Pin No.	PIN NAME	TYPE	DESCRIPTION
1	FSIN	Input	Frame Sync Input
2	STROBE	Output	LED Strobe Output
3	GND	Ground	Ground

### 6 Mechanical Dimension



### 7 Technical Support

Please check more information about using this camera from MIPI camera adapter board and Arducam USB camera shield user guide or contact [support@arducam.com](mailto:support@arducam.com) for more support.