# Table of Contents

1. Introduction ........................................................................................................... 2  
2. Block Diagram ...................................................................................................... 2  
3. Features .................................................................................................................. 3  
4. Key Specifications .................................................................................................. 3  
5. Application ............................................................................................................. 4  
6. Pin Definition .......................................................................................................... 4  
7. Lens Options .......................................................................................................... 5  
8. Mechanical Dimension .......................................................................................... 6
1 Introduction

In order to meet the increasing need of Raspberry Pi compatible camera modules, the ArduCAM team now released a revision C add-on camera module for Raspberry Pi which is fully compatible with official one. It optimizes the optical performance than the previous Pi cameras, and give user a much clear and sharp image. Also it provides the FREX and STROBE signals which can be used for multi-camera synchronize capture with proper camera driver firmware.

It attaches to Raspberry Pi by way of one of the two small sockets on the board upper surface. This interface uses the dedicated CSI interface, which was designed especially for interfacing to cameras. The CSI bus is capable of extremely high data rates, and it exclusively carries pixel data. The camera is supported in the latest version of Raspbian, Raspberry Pi’s preferred operating system.

The board itself is tiny, at around 36mm x 36mm. The highlight of our module is that the Lens is replaceable compared to official one, making it perfect for mobile or other applications where size and image quality are important. It connects to Raspberry Pi by way of a short ribbon cable. The camera is connected to the BCM2835/BCM2836 processor on the Pi via the CSI bus, a higher bandwidth link which carries pixel data from the camera back to the processor. This bus travels along the ribbon cable that attaches the camera board to the Pi.

The sensor itself has a native resolution of 5 megapixel, and has a fixed focus lens onboard. In terms of still images, the camera is capable of 2592 x 1944 pixel static images, and also supports 1080p30, 720p60 and 640x480p60/90 video.

2 Block Diagram

Note: Raspberry Pi camera module only support MIPI interface, it doesn’t support DVP interface..
3 Features

- High-Definition video camera for Raspberry Pi Model A/B/B+ and Raspberry Pi 2
- Omnivision OV5647 sensor in a fixed-focus module with replaceable Lens
- Lens holder: M12x0.5, CS mount or C mount
- 5MPixel sensor
- Integral IR filter
- Still picture resolution: 2592 x 1944
- Max video resolution: 1080p
- Max frame rate: 30fps
- Support FREX/STROBE feature
- Size: 36 x 36 mm
- 15 cm flat ribbon cable to 15-pin MIPI Camera Serial Interface (CSI) connector

4 Key Specifications

- active array size: 2592 x 1944
- power supply:
  - core: 1.5V ± 5% (with embedded 1.5V regulator)
  - analog: 2.6 ~ 3.0V (2.8V typical)
  - I/O: 1.7V ~ 3.0V
- power requirements:
  - active: TBD
  - standby: TBD
- temperature range:
  - operating: -30°C to 70°C (see table 8.2)
  - stable image: 0°C to 50°C (see table 8.2)
- output formats: 8-/10-bit RGB RAW output
- lens size: 1/4"
- lens chief ray angle: 24° (see figure 10.2)
- input clock frequency: 6~27 MHz
- S/N ratio: TBD
- dynamic range: TBD

- maximum image transfer rate:
  - QXGA (2592 x 1944): 15 fps
  - 1080p: 30 fps
  - 960p: 45 fps
  - 720p: 60 fps
  - VGA (640 x 480): 90 fps
  - QVGA (320 x 240): 120 fps
- sensitivity: TBD
- shutter: rolling shutter / global shutter
- maximum exposure interval: 1N68 x trowing
- pixel size: 1.4 μm x 1.4 μm
- well capacity: TBD
- dark current: TBD
- fixed pattern noise (FPN): TBD
- image area: 3673.6 μm x 2738.4 μm
- die dimensions: 5520 μm x 4700 μm
5 Application

- Cellular phones
- PDAs
- Toys
- Other battery-powered products
- Can be used in Raspberry Pi, ARM, DSP, FPGA platforms

6 Pin Definition

Table 1 P1 Connector Pin Definition

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>PIN NAME</th>
<th>TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DGND</td>
<td>Ground</td>
<td>Power ground</td>
</tr>
<tr>
<td>2</td>
<td>CAM_D0_N</td>
<td>Output</td>
<td>MIPI data lane0 negative output</td>
</tr>
<tr>
<td>3</td>
<td>CAM_D0_P</td>
<td>Output</td>
<td>MIPI data lane0 positive output</td>
</tr>
<tr>
<td>4</td>
<td>DGND</td>
<td>Ground</td>
<td>Power ground</td>
</tr>
<tr>
<td>5</td>
<td>CAM_D1_N</td>
<td>Output</td>
<td>MIPI data lane1 negative output</td>
</tr>
<tr>
<td>6</td>
<td>CAM_D1_P</td>
<td>Output</td>
<td>MIPI data lane1 positive output</td>
</tr>
<tr>
<td>7</td>
<td>DGND</td>
<td>Ground</td>
<td>Power ground</td>
</tr>
<tr>
<td>8</td>
<td>CAM_C_N</td>
<td>Output</td>
<td>MIPI clock negative output</td>
</tr>
<tr>
<td>9</td>
<td>CAM_C_P</td>
<td>Output</td>
<td>MIPI clock positive output</td>
</tr>
<tr>
<td>10</td>
<td>DGND</td>
<td>Ground</td>
<td>Power ground</td>
</tr>
<tr>
<td>11</td>
<td>POWER_EN</td>
<td>Input</td>
<td>Camera module power enable active high</td>
</tr>
<tr>
<td>12</td>
<td>LED_EN</td>
<td>Input</td>
<td>Reserved</td>
</tr>
<tr>
<td>13</td>
<td>SCL</td>
<td>Input</td>
<td>Two-Wire Serial Interface Clock</td>
</tr>
<tr>
<td>14</td>
<td>SDA</td>
<td>Bi-directional</td>
<td>Two-Wire Serial Interface Data I/O</td>
</tr>
<tr>
<td>15</td>
<td>+3.3V</td>
<td>POWER</td>
<td>3.3v Power supply</td>
</tr>
</tbody>
</table>

Table 2 P2 Connector Pin Definition

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>PIN NAME</th>
<th>TYPE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+3.3V</td>
<td>POWER</td>
<td>3.3v Power supply</td>
</tr>
<tr>
<td>2</td>
<td>DGND</td>
<td>Ground</td>
<td>Power ground</td>
</tr>
<tr>
<td>3</td>
<td>STROBE</td>
<td>Output</td>
<td>Strobe output</td>
</tr>
<tr>
<td>4</td>
<td>FREX</td>
<td>Input</td>
<td>Frame exposure control</td>
</tr>
</tbody>
</table>
7 Lens Options

The Raspberry Pi camera shipped with default LS-40136 (M12x0.5 mount) and LS-6018 (CS mount). Lenses specification list as follows. Please contact us admin@arducam.com for more lens options.

LS-40136 Lens Specification

A. Specification: LS-40136
1. sensor size: 1/4"
2. focal length(EFL): 3.2 mm
3. F/NO(infinity): 2.0
4. back focal length: 1.6 mm
5. Field of view:
   Diagonal: 85°
   Horizontal: 63.7°
   Vertical: 70°
6. Thread size: M12×P0.5
7. Elements: 5E+1IR

LS-6018 Lens Specification

<table>
<thead>
<tr>
<th>型号 Model No.</th>
<th>LS-6018CS</th>
<th>视场角 Field of View</th>
<th>68°</th>
</tr>
</thead>
<tbody>
<tr>
<td>焦距 Focal Length</td>
<td>6.0MM</td>
<td>外型尺寸 Dimensions</td>
<td>φ28×24.2mm</td>
</tr>
<tr>
<td>通光口径 Aperture(F)</td>
<td>1.4</td>
<td>近摄距离 M.O.D(m)</td>
<td>0.1</td>
</tr>
<tr>
<td>接口 Mount</td>
<td>CS</td>
<td>净重 Weight(g)</td>
<td>29.0</td>
</tr>
<tr>
<td>靶面尺寸 Format</td>
<td>1/2.7&quot;</td>
<td>备注 Remarks</td>
<td>Metal</td>
</tr>
</tbody>
</table>
8 Mechanical Dimension