# ArduCam

# Raspberry Pi Camera Module

## 1/4-Inch 8-Megapixel Module Datasheet

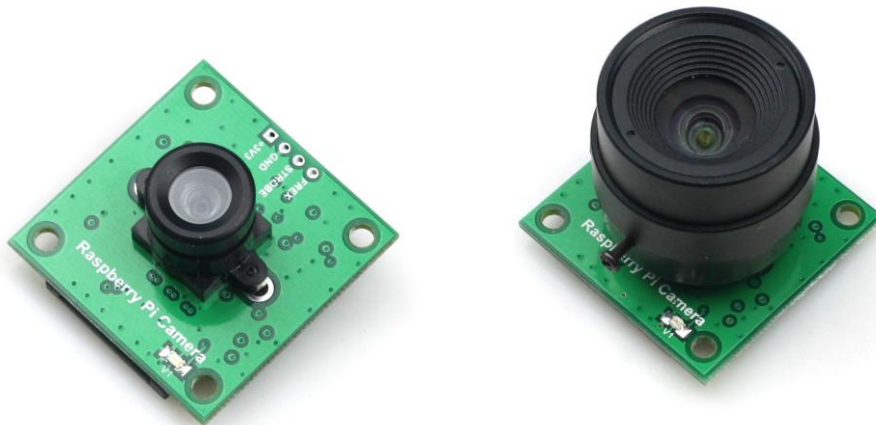Rev 1.0, Oct 2016

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**www.ArduCAM.com**

# 1 Introduction

In order to meet the increasing need of Raspberry Pi compatible camera modules. The ArduCAM team now released a IMX219 8MP 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 FSTROBE signals which can be used for multi-camera synchronize capture with proper camera driver firmware, as well as providing motorized IR cut driver circuit onboard for NOIR type 8MP sensor for both day light and night vision.

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 changeable 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/BCM2837 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 8 megapixel, and has a fixed focus lens onboard. In terms of still images, the camera is capable of 3296 x 2480 pixel static images. It also supports 1080p30, 720p60 and VGA90 video modes.

# 2 Block Diagram
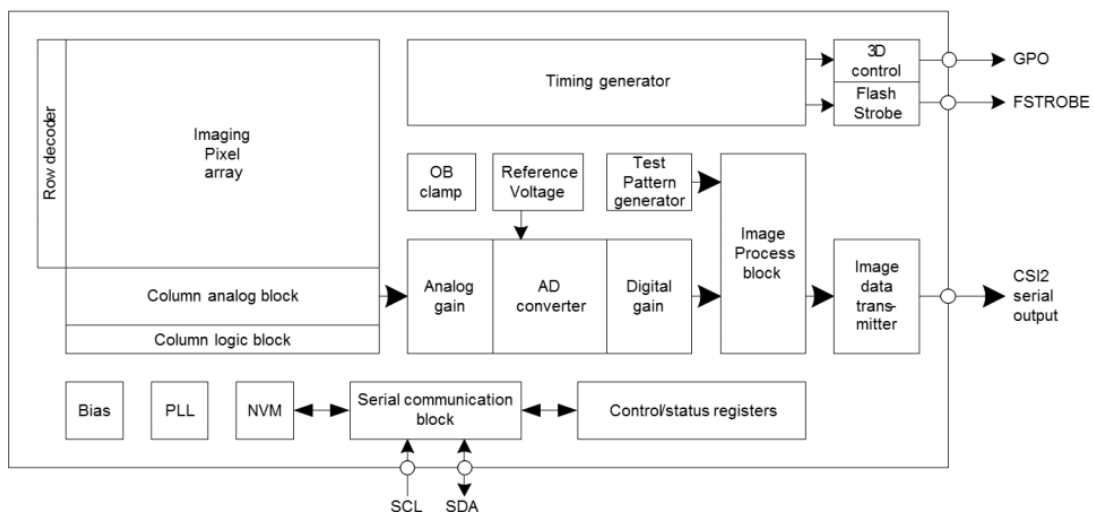
# 3  Features

➢ High-Definition video camera for Raspberry Pi Model A/B/B+ and Raspberry Pi 2/ Pi 3

➢ Sony IMX219PQ sensor in a fixed-focus module with changeable Lens

➢ Lens holder: M12x0.5 , CS mount or C mount

➢ 8MPixel sensor

➢ Selectable IR or NOIR sensor type and motorized IR cut driver

➢ Still picture resolution: 3280 x 2464

➢ Max video resolution: 1080p

➢ Max frame rate: 30fps

➢ Export FSTROBE signal

➢ 15 cm flat ribbon cable to 15-pin MIPI Camera Serial Interface (CSI) connector

# 4  Key Specifications

➢ Sensor size: 3.674 x 2.760 mm (1/4" format)

➢ Pixel Count: 3280 x 2464 (active pixels) 3296 x 2512 (total pixels)

➢ Pixel Size: 1.12 x 1.12 um

➢ Video Modes:

➢ 1 - 1080P30 cropped (680 pixels off left/right, 692 pixels off top/bottom), up to 30fps

➢ 2 - 3240x2464 Full 4:3, up to 15fps

➢ 3 - 3240x2464 Full 4:3, up to 15fps (identical to 2)

➢ 4 - 1640x1232 binned 4:3, up 40fps

➢ 5 - 1640x922 2x2 binned 16:9 (310 px crop T/B before binning), up to 40fps

➢ 6 - 720P bin+crop (360 px L/R, 512 px T/B before binning), up to 90fps

➢ 7 - VGA bin+crop (1000 px L/R, 752 px T/B before binning), up to 90fps

➢ Board size: 36 x 36 mm

# 5 Application

➢ Home security camera
➢ Time-lapse, slow-motion, and other video cleverness
➢ Wildlife camera
➢ Other battery-powered products
➢ Can be used in all Raspberry Pi platforms
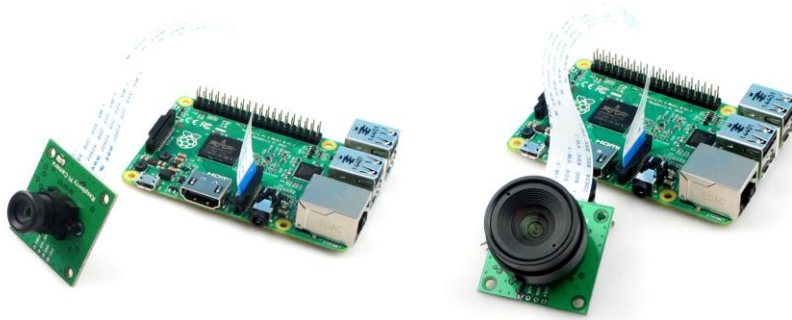


# 6 Pin Definition

Table 1 P1 Connector Pin Definition

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

Table 2 P2 Connector Pin Definition

| Pin No. | PIN NAME | TYPE | DESCRIPTION |
|---------|----------|------|-------------|
| 1 | +3.3V | POWER | 3.3v Power supply |
| 2 | DGND | Ground | Power ground |
| 3 | GPO | Input/Output | GPIO signal from IMX219 |
| 4 | FSTROBE | Output | Strobe output |
| 5 | IR | Input | Motorized IR cut driver switch LVTTL input |
| 6 | GND | Ground | Power ground |
| 7 | SDA | Input/Output | Camera I2C SDA signal |
| 8 | SCL | input | Camera I2C SCL signal |

Note: The IR signal is also connected to the camera LED GPIO, so user can control the camera LED pin to switch the IR cut ON/OFF.

# 7 Lens Options

The Raspberry Pi camera shipped with default HX-27227 (M12x0.5 mount) and LS-2716 (CS mount), Lenses specification list as follows. Please contact us admin@arducam.com for more lens options or visit www.arducam.com/downloads/Lenses/.
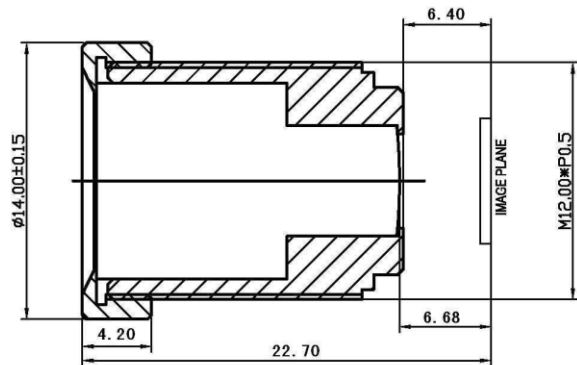
### HX-27227 Lens Specification



### LS-2717 Lens Specification

| 技 术 参 数 Technical parameters | | | |
|---|---|---|---|
| 型号 Model No. | LS-2717CS | 视场角 Field of View | 91° |
| 焦距 Focal Length | 4.0MM | 外型尺寸 Dimensions | Φ28*24.08 |
| 通光口径 Aperture(F) | F1.4 | 近摄距离 M.O.D(m) | 0.3 |
| 接口 Mount | CS | 净重 Weight(g) | 20g |
| 靶面尺寸 Format | 1/3" | 备注 Remarks | 全金属 |

# 8   Mechanical Dimension