

# CAMERA MODULE

The Raspberry Pi Camera Module is an official product from the Raspberry Pi Foundation. The original 5-megapixel model was [released](#) in 2013, and an 8-megapixel Camera Module v2 was [released](#) in 2016. For both iterations, there are visible light and infrared versions.

## Hardware specification

	Camera Module v2
Weight	3g
Still resolution	8 Megapixels
Video modes	1080p30, 720p60 and 640 × 480p60/90
Linux integration	V4L2 driver available
C programming API	OpenMAX IL and others available
Sensor	<a href="#">Sony IMX219</a>
Sensor resolution	3280 × 2464 pixels
Sensor image area	3.68 x 2.76 mm (4.6 mm diagonal)
Pixel size	1.12 μm x 1.12 μm
Optical size	1/4"
Full-frame SLR lens equivalent	
S/N ratio	
Dynamic range	
Sensitivity	
Dark current	
Well capacity	
Fixed focus	
Focal length	3.04 mm
Horizontal field of view	62.2 degrees
Vertical field of view	48.8 degrees
Focal ratio (F-Stop)	2.0

## Hardware features

Available	Implemented
Chief ray angle correction	Yes
Global and rolling shutter	Rolling shutter
Automatic exposure control (AEC)	No - done by ISP instead
Automatic white balance (AWB)	No - done by ISP instead
Automatic black level calibration (ABLC)	No - done by ISP instead
Automatic 50/60 Hz luminance detection	No - done by ISP instead
Frame rate up to 120 fps	Max 90fps. Limitations on frame size for the higher frame rates (VGA only for above 47fps)
AEC/AGC 16-zone size/position/weight control	No - done by ISP instead
Mirror and flip	Yes
Cropping	No - done by ISP instead (except 1080p mode)
Lens correction	No - done by ISP instead
Defective pixel cancelling	No - done by ISP instead
10-bit RAW RGB data	Yes - format conversions available via GPU
Support for LED and flash strobe mode	LED flash
Support for internal and external frame synchronisation for frame exposure mode	No
Support for 2 × 2 binning for better SNR in low light conditions	Anything output res below 1296 x 976 will use the 2 x 2 binned mode
Support for horizontal and vertical sub-sampling	Yes, via binning and skipping
On-chip phase lock loop (PLL)	Yes
Standard serial SCCB interface	Yes
Digital video port (DVP) parallel output interface	No
MIPI interface (two lanes)	Yes
32 bytes of embedded one-time programmable (OTP) memory	No
Embedded 1.5V regulator for core power	Yes