



# Banana Pro / Banana Pi Camera User Manual

Created by LeMaker R&D Team

## Products Picture

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## ● Overview



The picture showing above is a high definition camera module for the Banana Pro/ Banana Pi using an Omnivision 5640 CMOS image sensor in an auto-focus module and with an integral IR filter. The camera module connects to the Banana Pro / Banana Pi board via the CSI (CON1) connector designed specifically for interfacing to cameras. Providing high sensitivity, low crosstalk and low noise image capture in a small and lightweight design, it is an excellent and worthwhile accessory for your favourite SBC.

Banana Pro/Banana Pi Camera specific Specifications shown in the following table

Size		8.5mm × 8.5mm×7.0mm
Sensor Type		OV5640(1/4")
Still resolution		5 Megapixels
Active Array Size		2592 × 1944
Video Mode		1080p 720p 640 x 480p
Video stabilisation		No
Power supply	Core	1.5V±5% (with embedded 1.5V regulator)
	analog	2.6~3.0V(2.8v typical)
	I/O	1.8V/2.8V
F/No		2.8
EFL		3.37mm
BFL(OPTICAL)		0.58mm
Optical FOV		70°
TV Distortion	Horizontal	56.3°
	Diagonal	67.4°
	<1.0%	TV Distortion
Relative Illumination		41.7%
Thread		M6X0.35P
IR Filter		650±10nm
Object distance		20cm-180 cm
Resolution		≥200IW/PH(Center)
Image Area		3673.6µm x2738.4 µm
Sensitivity		TBD
Pixel size		1.4µm x 1.4µm
Temperature Range	operating	-30°C to 70°C
	Stable image	0°C to 50°C
Output Formats		8-/10-bit RGB RAW output
Max Frame Rate		30fps@24Mhz,VGA
S/N Ratio		TBD
Dynamic Range		TBD
IC Assembly		CSP
Substrate		FPC
Assembly technique		Glue
Power Consumption		219mW@30fps VGA
		36uW@standby
Package		CSP/wafer
Chief Ray Angle Correction		Yes
Automatic exposure control (AEC)		Yes
Automatic white balance (AWB)		Yes
Automatic black level calibration		Yes

Automatic black level calibration (ABLC)	Yes
Automatic 50/60 Hz luminance detection	Yes
Mirror and flip	Yes
Cropping	Yes
Lens correction	Yes
Support for LED and flash strobe mode	Yes
On-chip phase lock loop (PLL)	Yes
Standard serial SCCB interface	Yes
Digital video port (DVP) parallel output interface	Yes
MIPI interface	No
one-time programmable (OTP) memory	Yes
Embedded 1.5V regulator for core power	Yes



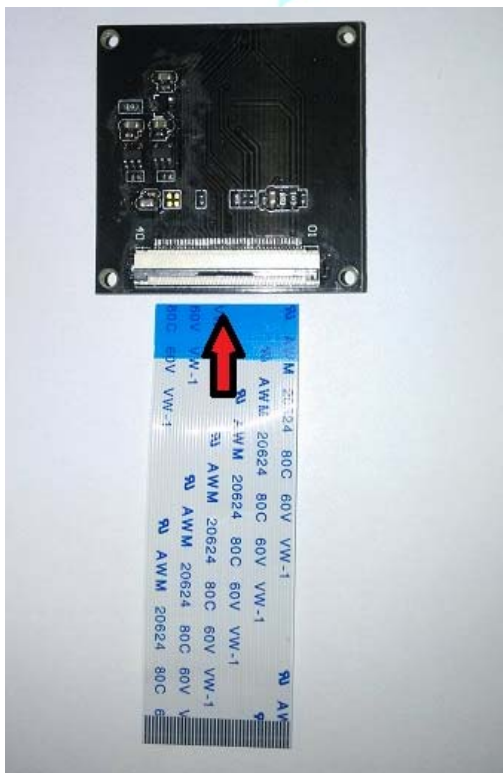
## ● Assembly

You can asserrmb the camera module as shown in the figure below.

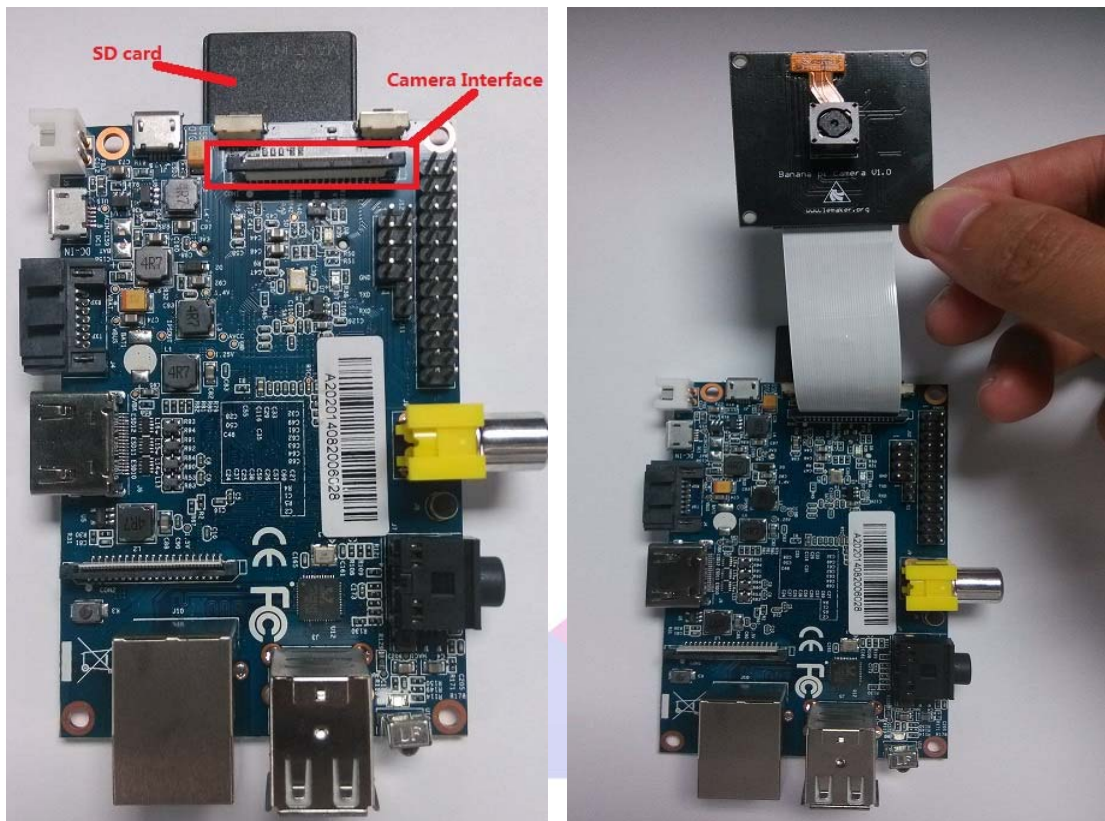
### Step 1



### Step 2:



Step 3:



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## ● Detailed Installation

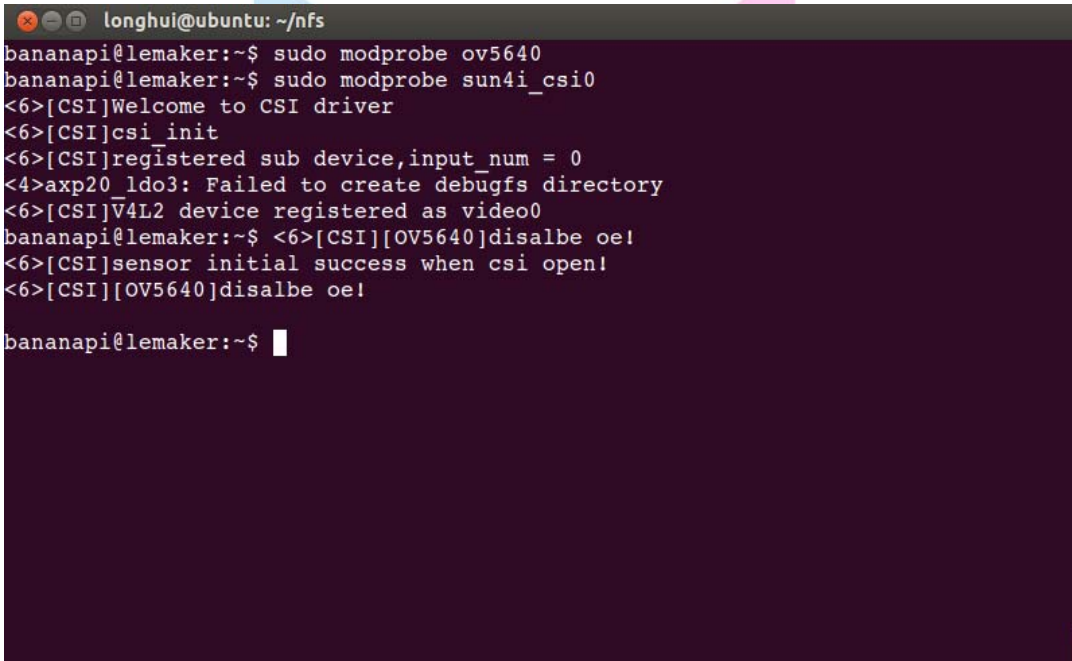
### 1. Connect

Connect your Camera to Banana Pro / Banana Pi board as shown above.

### 2. Install drivers

You have to load the drivers needed by camera modules:

```
sudo modprobe ov5640
sudo modprobe sun4i_csi0
```



```
longhui@ubuntu: ~/nfs
bananapi@lemaker:~$ sudo modprobe ov5640
bananapi@lemaker:~$ sudo modprobe sun4i_csi0
<6>[CSI>Welcome to CSI driver
<6>[CSI]csi_init
<6>[CSI]registered sub device,input_num = 0
<4>axp20_ldo3: Failed to create debugfs directory
<6>[CSI]V4L2 device registered as video0
bananapi@lemaker:~$ <6>[CSI][OV5640]disalbe oe!
<6>[CSI]sensor initial success when csi open!
<6>[CSI][OV5640]disalbe oe!

bananapi@lemaker:~$
```

### 3. Test camera

You can test you camera via mplayer:

```
mplayer tv://
```

If the camera is installed properly, mplayer will show the image in real time.