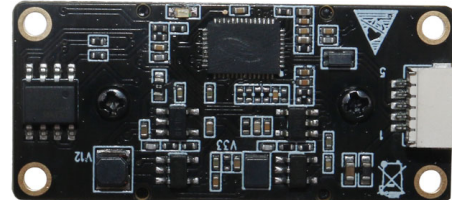


YDS-USB1A-OV5693 V2.0**5MP OmniVision OV5693 Auto Focus USB 2.0 M16 Camera Module**

YDS-USB1A-OV5693 V2.0 is a 5MP Auto Focus USB camera module based on 1/4" OV5693 image sensor. Auto Focus captures images clearly at different distances. It delivers high-speed, 2K resolution ultra sharp image.

The camera has a dedicated, high-performance auto focus function providing best-in-class image and video output. This camera module is ideal solution for drones, automotive, agriculture farming, medical equipment, and traffic monitoring.

Key Features

- 2592 x 1944 OmniVision OV5693 sensor
- High speed USB 2.0 Plug and Play
- MJPG and YUV2 output format
- UVC compliant to Windows, Linux, OS with UVC driver
- USB OTG (On-The-Go) support



YDS CAMERA MODULE

your best camera partner

YDS-USB1A-OV5693 V2.0

5MP OmniVision OV5693 Auto Focus USB 2.0 M16 Camera Module

| | |
|-------------------------|--|
| Camera Module No. | YDS-USB1A-OV5693 V2.0 |
| Resolution | 5MP |
| Image Sensor | OV5693 |
| Sensor Type | 1/4" |
| Pixel Size | 1.4 um x 1.4 um |
| EFL | 2.50 mm |
| F.NO | 2.10 |
| Pixel | 2592 x 1944 |
| View Angle | 135.0°(DFOV) 95.0°(HFOV) 70.0°(VFOV) |
| Lens Dimensions | 18.00 x 18.00 x 19.69 mm |
| Module Type | Auto Focus |
| Lens Model | YDS-LENS-MJ7023G |
| Interface | USB 2.0 |
| Output Format | MJPEG / YUV2 |
| Auto Control | Saturation, Contrast, Acutance White Balance, Exposure |
| Audio | Yes |
| Input Voltage | DC 5V |
| Working Current | Max 500mA |
| PCB Size | 40.00 x 18.00 mm |
| System Compatibility | Windows XP (SP2, SP3), Vista, 7, 8, 10, 11 Android, Mac OS, Linux or OS with UVC Driver Raspberry Pi by USB Port |
| Software for USB Camera | AMCAP, Webcam Viewer, V4L2 Controls Contacam, VLC Player, MotionEye OS iSpy, ZoneMider, Yawcam |
| Lens Type | 650nm IR Cut |
| Operating Temperature | -30°C to +70°C |
| USB Cable | YDS-Cable-U001 |

Wide Compatibility with Windows, Android, Mac OS, Linux, or Raspberry Pi



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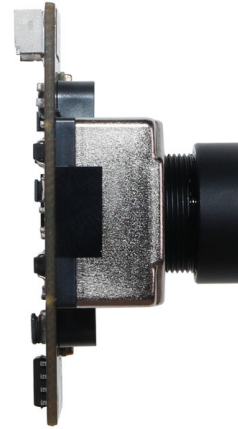


YDS-USB1A-OV5693 V2.0

5MP OmniVision OV5693 Auto Focus USB 2.0 M16 Camera Module



Top View



Side View



Bottom View



Mating Connector

YDS-USB1A-OV5693 V2.0

5MP OmniVision OV5693 Auto Focus USB 2.0 M16 Camera Module

| FORMAT | RESOLUTION | FRAME RATE |
|--------|---------------------|------------|
| | | USB 2.0 |
| MJPG | 640 x 480 (VGA) | 15 FPS |
| | 1280 x 720 (720P) | 15 FPS |
| | 1920 x 1080 (1080P) | 15 FPS |
| | 2592 x 1944 (5MP) | 15 FPS |
| YUY2 | 640 x 480 (VGA) | 15 FPS |
| | 1280 x 720 (720P) | 10 FPS |
| | 1920 x 1080 (1080P) | 5 FPS |
| | 2592 x 1944 (5MP) | 3 FPS |





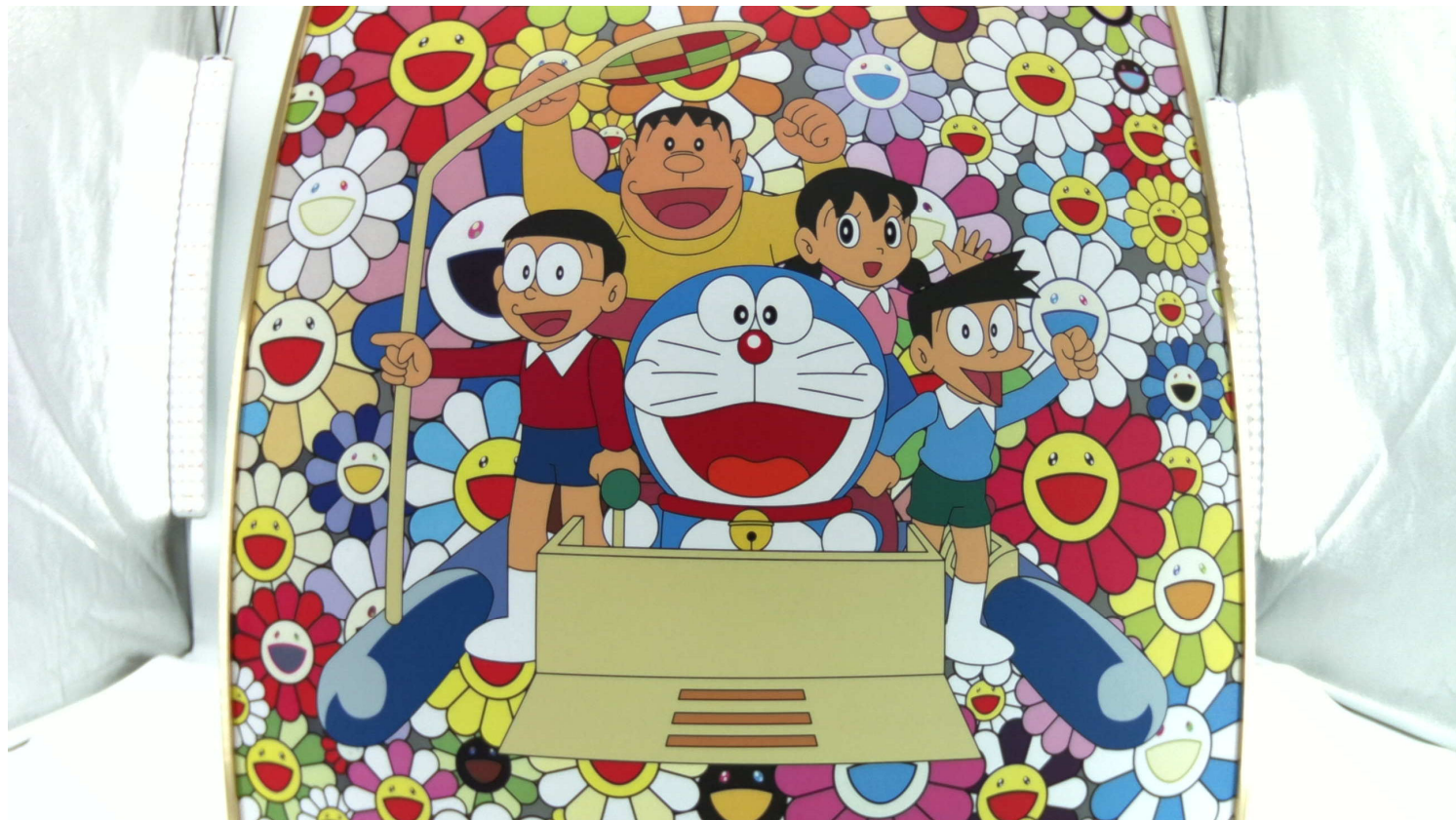
YDS CAMERA MODULE

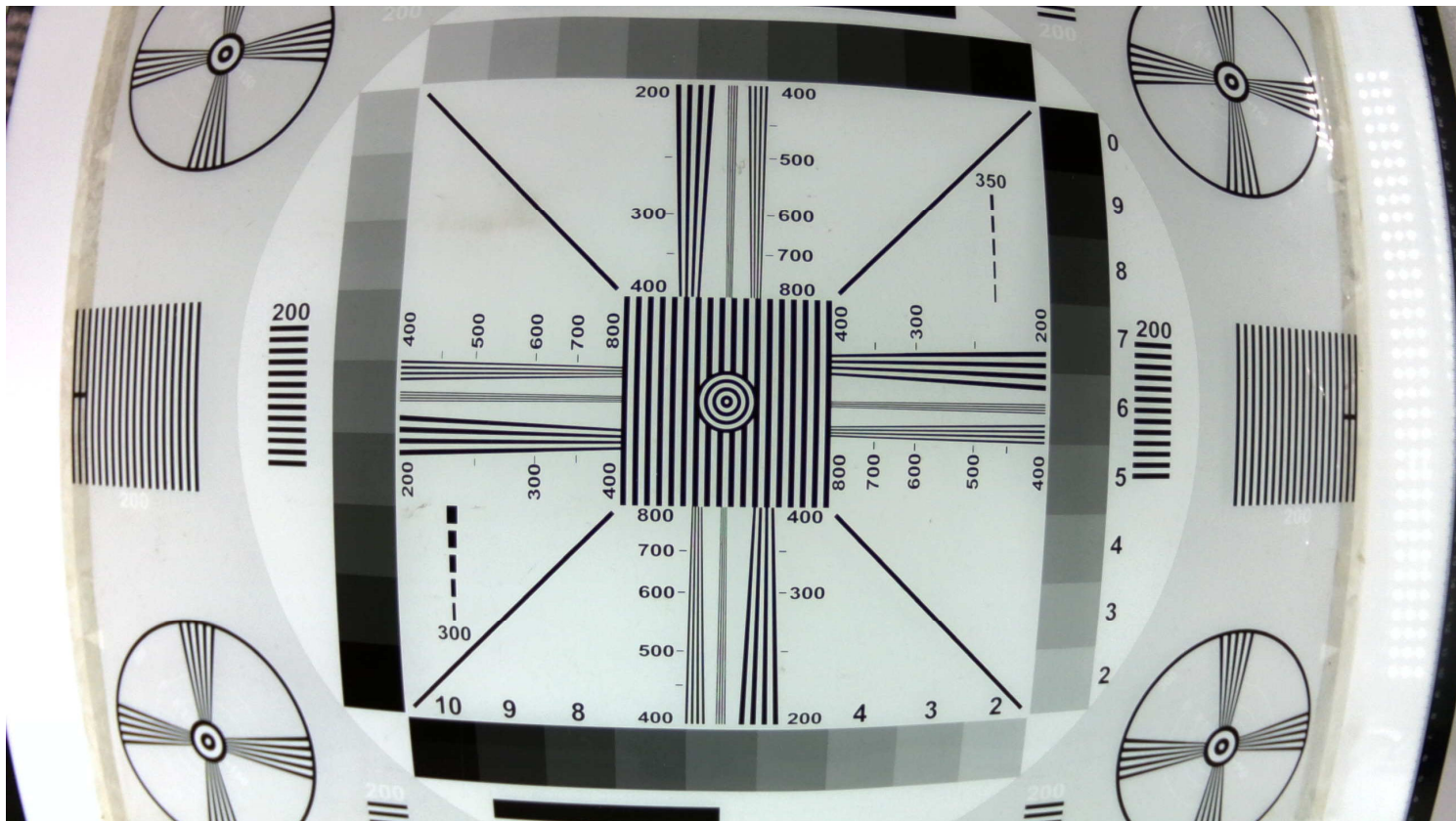
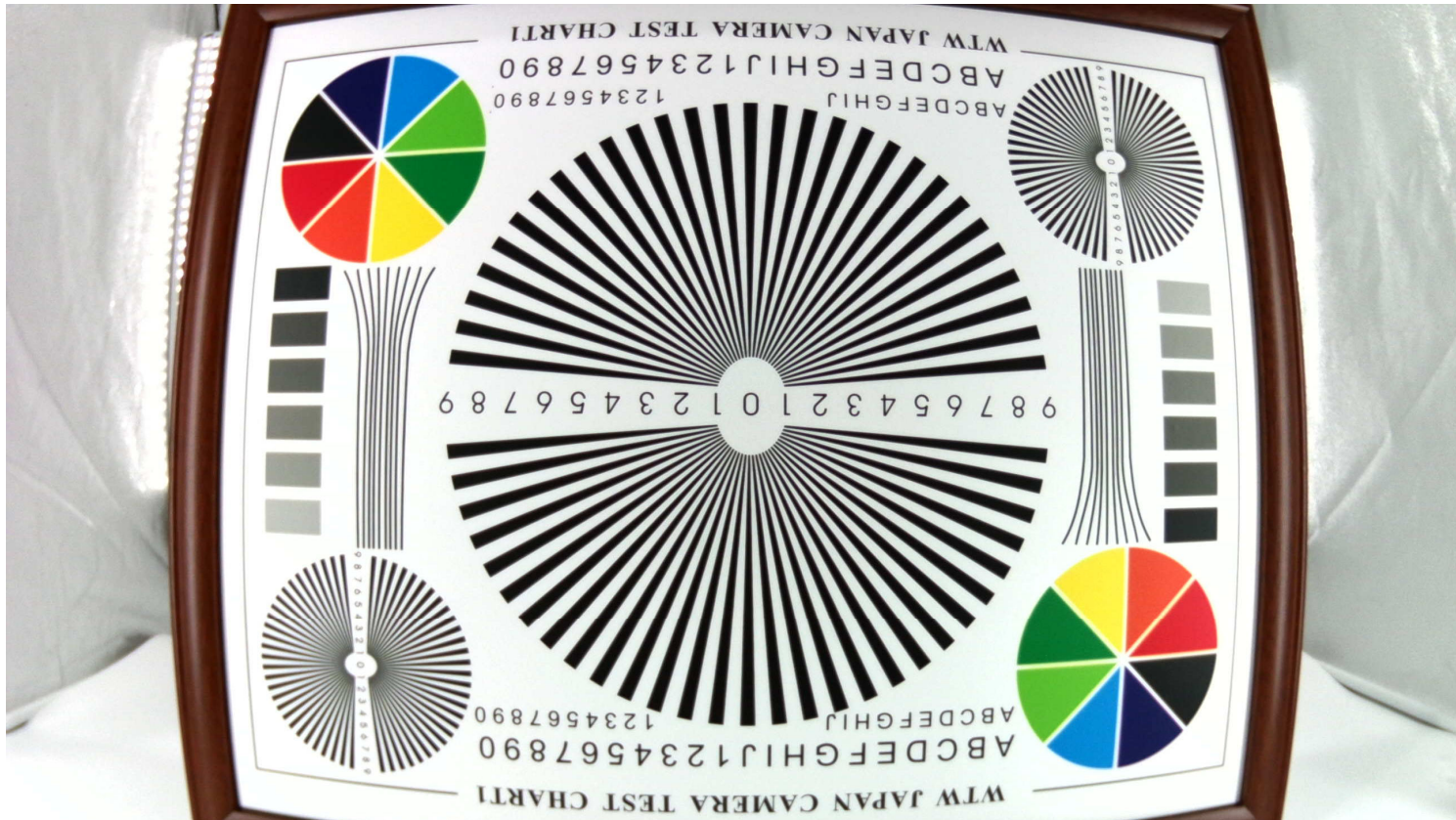
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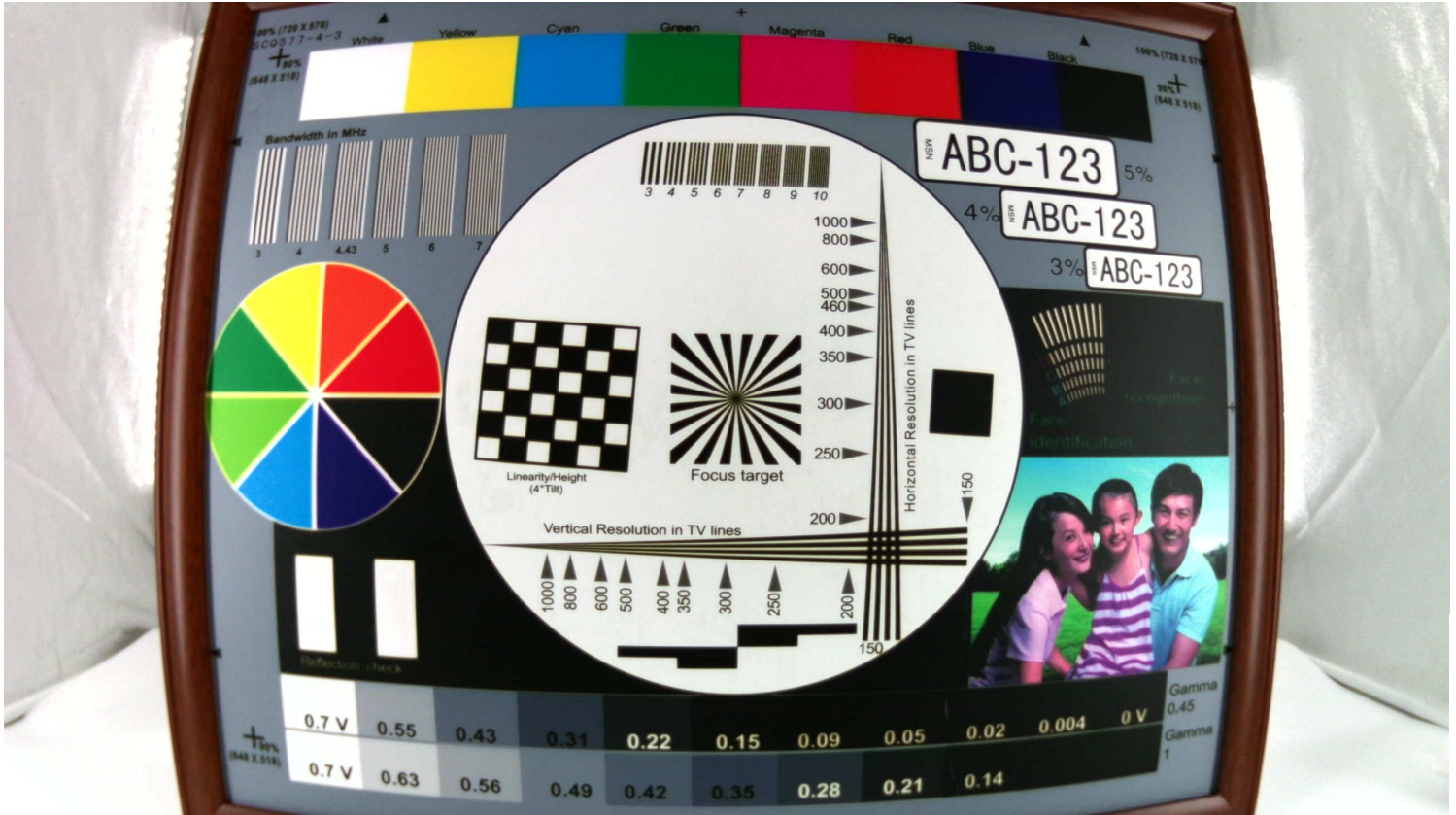






YDS CAMERA MODULE

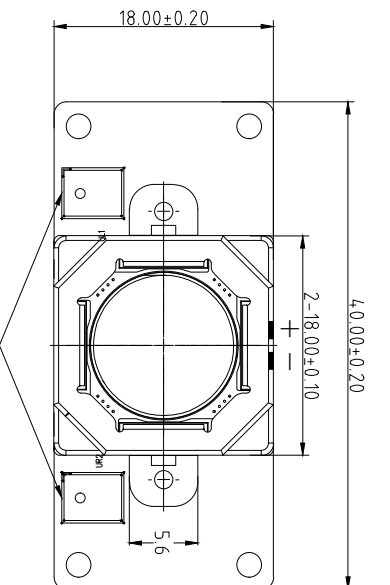
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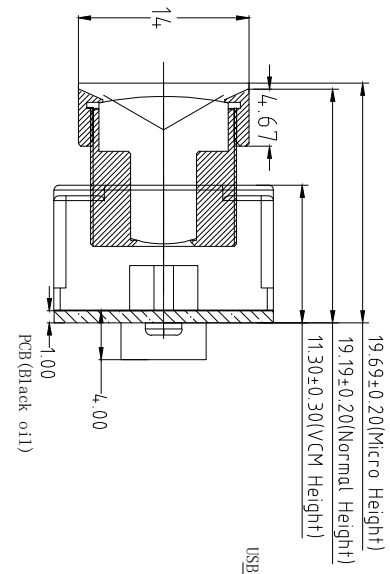
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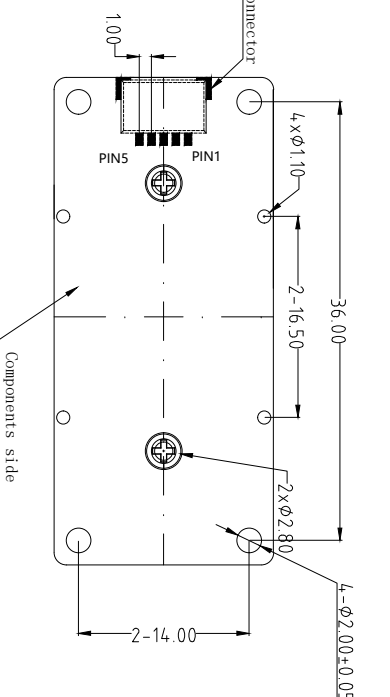
| Version | Information | Date |
|---------|---------------|------------|
| V1.0 | First Version | 12-28-2021 |
| V2.0 | Add MIC | 2-12-2022 |



TOP VIEW



SIDE VIEW



BOTTOM VIEW

| PIN NO | SIGNAL |
|--------|--------|
| 01 | USB 5V |
| 02 | D- |
| 03 | D+ |
| 04 | GND |
| 05 | GND |

Parameters:

1、Sensor specification:

Image Sensor: OV5693
 Pixel: 1.4umx1.4um
 Lens Type: 1/4
 Important Voltage Description: DVDD1.5V (external power supply);

2、Lens specification:

FOV: 135°(D);95°(H);70°(V);
 F/NO: 2.1
 TV distortion: <15%
 Focal length: 2.5mm
 Composition: 4G+IR FILTER
 IR Cut Coating: 650nm±10nm@50%

3

| | | | | | |
|-------------|-----------|------------------|-------------------|---------------|-----------------|
| Designed By | Kevin | Model Name: | USB1A-OV5693 V2.0 | | |
| Checked By | Aouly Yan | Projection Type: | Third Angle | Unit: mm | Material: ----- |
| | | Scale: | 1:1 | Sheet: 1 of 1 | Version: 1/0 |



OV5693 5-megapixel product brief



High-Performance 5-Megapixel Image Sensor for Front-Facing Cameras in Flagship Smartphones and Tablets



available in
a lead-free
package

The OV5693 is OmniVision's highest performance 1/4-inch, 5-megapixel image sensor, delivering DSC-quality imaging and low-light performance as well as full 1080p high-definition video recording at 30 frames per second (fps). Using OmniVision's proprietary 1.4-micron OmniBSI-2™ pixel architecture, the OV5693 provides best-in-class low-light performance and image quality in a slim camera module. This makes the OV5693 an ideal camera solution for slim flagship smartphones and tablets, providing exceptional 5-megapixel "selfie" images and high-quality 1080p video.

Leveraging OmniVision's second-generation industry-leading backside illumination pixel technology, the OV5693 offers full resolution 5-megapixel images at 30 fps, an integrated scaler, and 2x2 binning

functionality with re-sampling filter. The scaler enables electronic image stabilization, while maintaining full field-of-view in both 720p and 1080p HD video modes. The 2x2 binning functionality, which features a post-binning re-sampling filter, further increases the sensor's sensitivity, while minimizing spatial artifacts and removing image artifacts around edges to produce crisp, clean color images.

The sensor features a high-speed 2-lane MIPI interface running up to 900 Mbps per lane and fits into an industry standard module size of 8.5 x 8.5 mm with a z-height of 4.2 mm for an autofocus module.

Find out more at www.ovt.com.



Applications

- Cellular and Mobile Phones
- Digital Still Cameras (DSC)
- Digital Video Camcorders (DVC)
- PC Multimedia
- 3D Cameras

Product Features

- automatic black level calibration (ABLC)
- programmable controls for frame rate, mirror and flip, cropping, windowing, and scaling
- image quality controls: lens correction and defective pixel canceling
- supports output formats: 10-bit RAW RGB (MIPI)
- supports horizontal and vertical subsampling
- supports images sizes: 5MP, EIS1080p, 1080p, 720p, VGA, QVGA
- fast mode switching
- supports 3D applications
- support 2x2 binning, full scalar
- standard serial SCCB interface
- up to 2-lane MIPI serial output interface
- embedded 512 bytes one-time programmable (OTP) memory for part identification, etc.
- two on-chip phase lock loop (PLL)
- programmable I/O drive capability
- built-in 1.2V regulator for core
- built-in temperature sensor
- supports alternate row HDR timing

OV5693



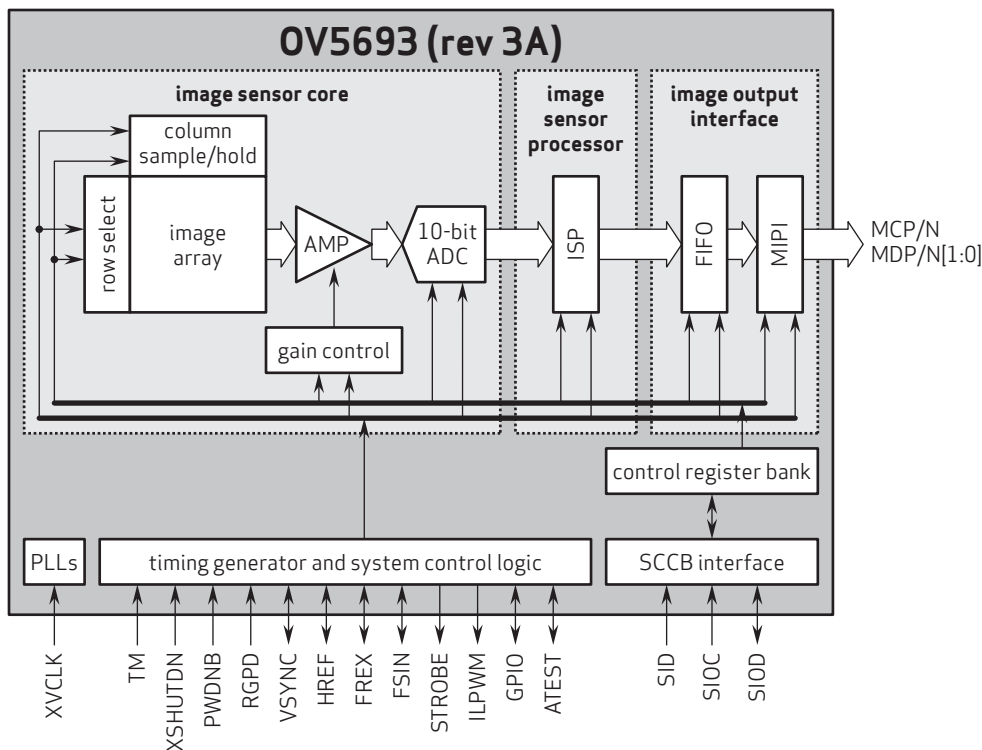
Ordering Information

- OV5693-G06H-3A**
(color, chip probing, 180 μ m backgrinding, reconstructed 8" wafer with good die)
- OV5693-G36H-3A**
(color, chip probing, 180 μ m backgrinding, reconstructed 12" wafer with good die)

Product Specifications

- active array size:** 2592 x 1944
- max S/N ratio:** 37.1 dB
- power supply:**
 - core: 1.16 - 1.3V (1.2V typical)
 - analog: 2.6 - 3.0V
 - I/O: 1.7 - 3.0V
- power requirements:**
 - active: 239 mW
 - XSHUTDN: 1 μ W
- temperature range:**
 - operating: -30°C to +70°C junction temperature
 - stable image: 0°C to +50°C junction temperature
- output formats:** 10-bit RGB RAW
- lens size:** 1/4"
- lens chief ray angle:** 29.7° non-linear
- input clock frequency:** 6 - 27 MHz
- dynamic range:** 68.0 dB @ 8x gain
- maximum image transfer rate:**
 - SMP: 30 fps
 - EIS1080p: 30 fps
 - 1080p: 30 fps
- sensitivity:** 1000 mV/lux-sec
- scan mode:** progressive
- pixel size:** 1.4 μ m x 1.4 μ m
- dark current:** 3.3 mV/sec @ 60°C junction temperature
- image area:** 3673.6 μ m x 2738.4 μ m
- dimensions:**
 - COB: 5350 μ m x 4800 μ m
 - RW: 5400 μ m x 4850 μ m

Functional Block Diagram



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OmniVision



YDS CAMERA MODULE

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Camera Module Pinout Definition Reference Chart

| OmniVision | Sony | Samsung | On-Semi | Aptina | Himax | GalaxyCore | PixArt | SmartSens | Sensors |
|-------------------------------|------|---|---------|--------|-------|------------|--------|-----------|---------|
| Pin Signal | | Description | | | | | | | |
| DGND GND | | ground for digital circuit | | | | | | | |
| AGND | | ground for analog circuit | | | | | | | |
| PCLK DCK | | DVP PCLK output | | | | | | | |
| XCLR PWDN XSHUTDOWN STANDBY | | power down active high with internal pull-down resistor | | | | | | | |
| MCLK XVCLK XCLK INCK | | system input clock | | | | | | | |
| RESET RST | | reset active low with internal pull-up resistor | | | | | | | |
| NC NULL | | no connect | | | | | | | |
| SDA SIO_D SIOD | | SCCB data | | | | | | | |
| SCL SIO_C SIOC | | SCCB input clock | | | | | | | |
| VSYNC XVS FSYNC | | DVP VSYNC output | | | | | | | |
| HREF XHS | | DVP HREF output | | | | | | | |
| DOVDD | | power for I/O circuit | | | | | | | |
| AFVDD | | power for VCM circuit | | | | | | | |
| AVDD | | power for analog circuit | | | | | | | |
| DVDD | | power for digital circuit | | | | | | | |
| STROBE FSTROBE | | strobe output | | | | | | | |
| FSIN | | synchronize the VSYNC signal from the other sensor | | | | | | | |
| SID | | SCCB last bit ID input | | | | | | | |
| ILPWM | | mechanical shutter output indicator | | | | | | | |
| FREQ | | frame exposure / mechanical shutter | | | | | | | |
| GPIO | | general purpose inputs | | | | | | | |
| SLASEL | | I2C slave address select | | | | | | | |
| AFEN | | CEN chip enable active high on VCM driver IC | | | | | | | |
| MIPI Interface | | | | | | | | | |
| MDN0 DN0 MD0N DATA_N DMO1N | | MIPI 1st data lane negative output | | | | | | | |
| MDP0 DP0 MD0P DATA_P DMO1P | | MIPI 1st data lane positive output | | | | | | | |
| MDN1 DN1 MD1N DATA2_N DMO2N | | MIPI 2nd data lane negative output | | | | | | | |
| MDP1 DP1 MD1P DATA2_P DMO2P | | MIPI 2nd data lane positive output | | | | | | | |
| MDN2 DN2 MD2N DATA3_N DMO3N | | MIPI 3rd data lane negative output | | | | | | | |
| MDP2 DP2 MD2P DATA3_P DMO3P | | MIPI 3rd data lane positive output | | | | | | | |
| MDN3 DN3 MD3N DATA4_N DMO4N | | MIPI 4th data lane negative output | | | | | | | |
| MDP3 DP3 MD3P DATA4_P DMO4P | | MIPI 4th data lane positive output | | | | | | | |
| MCN CLKN CLK_N DCKN | | MIPI clock negative output | | | | | | | |
| MCP CLKP MCP CLK_P DCKN | | MIPI clock positive output | | | | | | | |
| DVP Parallel Interface | | | | | | | | | |
| D0 DO0 Y0 | | DVP data output port 0 | | | | | | | |
| D1 DO1 Y1 | | DVP data output port 1 | | | | | | | |
| D2 DO2 Y2 | | DVP data output port 2 | | | | | | | |
| D3 DO3 Y3 | | DVP data output port 3 | | | | | | | |
| D4 DO4 Y4 | | DVP data output port 4 | | | | | | | |
| D5 DO5 Y5 | | DVP data output port 5 | | | | | | | |
| D6 DO6 Y6 | | DVP data output port 6 | | | | | | | |
| D7 DO7 Y7 | | DVP data output port 7 | | | | | | | |
| D8 DO8 Y8 | | DVP data output port 8 | | | | | | | |
| D9 DO9 Y9 | | DVP data output port 9 | | | | | | | |
| D10 DO10 Y10 | | DVP data output port 10 | | | | | | | |
| D11 DO11 Y11 | | DVP data output port 11 | | | | | | | |

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Cameras Applications



IMAGING DEVICES



Camera Reliability Test

| Reliability Inspection Item | | Testing Method | Acceptance Criteria | |
|-----------------------------|-----------------------------|---|-------------------------|-------------------------|
| Category | Item | | | |
| Environmental | Storage Temperature | High 60°C 96 Hours | Temperature Chamber | No Abnormal Situation |
| | | Low -20°C 96 Hours | Temperature Chamber | No Abnormal Situation |
| | Operation Temperature | High 60°C 24 Hours | Temperature Chamber | No Abnormal Situation |
| | | Low -20°C 24 Hours | Temperature Chamber | No Abnormal Situation |
| | Humidity | 60°C 80% 24 Hours | Temperature Chamber | No Abnormal Situation |
| | Thermal Shock | High 60°C 0.5 Hours Low -20°C 0.5 Hours Cycling in 24 Hours | Temperature Chamber | No Abnormal Situation |
| Physical | Drop Test (Free Falling) | Without Package 60cm | 10 Times on Wood Floor | Electrically Functional |
| | | With Package 60cm | 10 Times on Wood Floor | Electrically Functional |
| | Vibration Test | 50Hz X-Axis 2mm 30min | Vibration Table | Electrically Functional |
| | | 50Hz Y-Axis 2mm 30min | Vibration Table | Electrically Functional |
| | | 50Hz Z-Axis 2mm 30min | Vibration Table | Electrically Functional |
| | Cable Tensile Strength Test | Loading Weight 4 kg 60 Seconds Cycling in 24 Hours | Tensile Testing Machine | Electrically Functional |
| Electrical | ESD Test | Contact Discharge 2 KV | ESD Testing Machine | Electrically Functional |
| | | Air Discharge 4 KV | ESD Testing Machine | Electrically Functional |
| | Aging Test | On/Off 30 Seconds Cycling in 24 Hours | Power Switch | Electrically Functional |
| | USB Connector | On/Off 250 Times | Plug and Unplug | Electrically Functional |



Camera Inspection Standard

| Inspection Item | | Inspection Method | Standard of Inspection | | |
|------------------|----------|-------------------|-----------------------------|--|---------------------------------|
| Category | Item | | | | |
| Appearance | FPC/ PCB | Color | The Naked Eye | Major Difference is Not Allowed. | |
| | | Be Torn/Chopped | The Naked Eye | Copper Crack Exposure is Not Allowed. | |
| | | Marking | The Naked Eye | Clear, Recognizable (Within 30cm Distance) | |
| | Holder | Scratches | The Naked Eye | The Inside Crack Exposure is Not Allowed | |
| | | Gap | The Naked Eye | Meet the Height Standard | |
| | | Screw | The Naked Eye | Make Sure Screws Are Presented (If Any) | |
| | | Damage | The Naked Eye | The Inside Crack Exposure is Not Allowed | |
| | Lens | Scratch | The Naked Eye | No Effect On Resolution Standard | |
| | | Contamination | The Naked Eye | No Effect On Resolution Standard | |
| | | Oil Film | The Naked Eye | No Effect On Resolution Standard | |
| | | Cover Tape | The Naked Eye | No Issue On Appearance. | |
| | Function | Image | No Communication | Test Board | Not Allowed |
| | | | Bright Pixel | Black Board | Not Allowed In the Image Center |
| Dark Pixel | | | White board | Not Allowed In the Image Center | |
| Blurry | | | The Naked Eye | Not Allowed | |
| No Image | | | The Naked Eye | Not Allowed | |
| Vertical Line | | | The Naked Eye | Not Allowed | |
| Horizontal Line | | | The Naked Eye | Not Allowed | |
| Light Leakage | | | The Naked Eye | Not Allowed | |
| Blinking Image | | | The Naked Eye | Not Allowed | |
| Bruise | | | Inspection Jig | Not Allowed | |
| Resolution | | | Chart | Follows Outgoing Inspection Chart Standard | |
| Color | | | The Naked Eye | No Issue | |
| Noise | | | The Naked Eye | Not Allowed | |
| Corner Dark | | | The Naked Eye | Less Than 100px By 100px | |
| Color Resolution | | | The Naked Eye | No Issue | |
| Dimension | Height | The Naked Eye | Follows Approval Data Sheet | | |
| | Width | The Naked Eye | Follows Approval Data Sheet | | |
| | Length | The Naked Eye | Follows Approval Data Sheet | | |
| | Overall | The Naked Eye | Follows Approval Data Sheet | | |

YDSCAM Package Solutions

YDS Camera Module



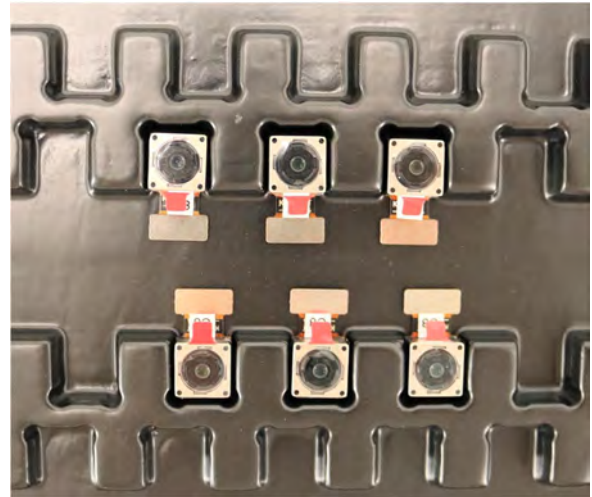
Complete with Lens Protection Film



Tray with Grid and Space



Place Cameras on the Tray



YDSCAM Package Solutions

Full Tray of Cameras



Cover Tray with Lid



Place Tray into Anti-Static Bag



Vacuum the Anti-Static Bag



YDSCAM Package Solutions

Sealed Vacuum Anti-Static Bag with Labels

1. Model and Description 2. Quantity 3. Manufacturing Date Code 4. Caution



YDSCAM Package Solutions

Place Foam Sheets Between Tray Bags



Foam Sheets are Larger Than Trays



Place Foam Sheets and Trays into Box



Foam Sheets are Tightly Fitting in Box



Seal the Carbon Box



Label the Carbon Shipping Box

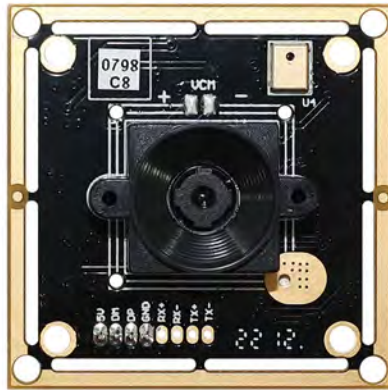




YDSCAM Package Solutions

USB Camera Module

Complete with Lens Protection Film



Place Camera Sample into Anti-Static Bag

Place USB Cameras into Tray



Seal the Tray with Anti-Static Bag

Label the Carbon Shipping Box



YDSCAM Package Solutions

Place Camera Sample into Anti-Static Bag



Place Connectors into Anti-Static Bag



Label the Sample Bags



Place Connectors into Reel



Place Samples into the Carbon Box



Place Connectors into the Carbon Box





YDS CAMERA MODULE

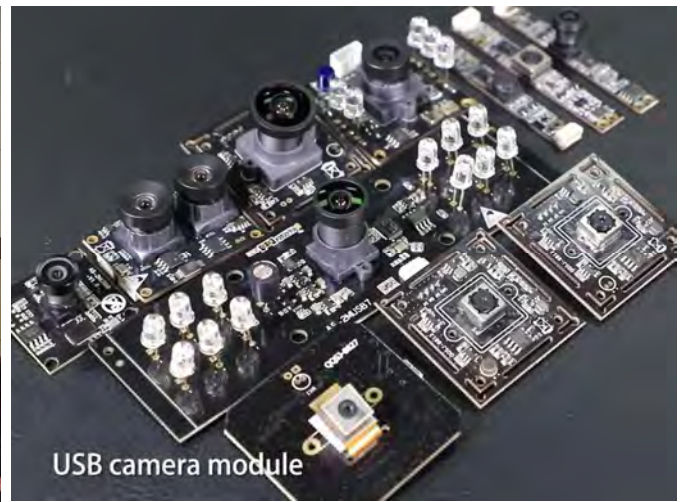
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Company YDSCAM

YingDeShun Co. Ltd. (YDS) was established in 2017, a next-generation technology driven manufacturer specialized in research, design, and produce of audio and video products. YDS is occupying 20,000 square feet automated plants with 100 employees of annual throughput 30,000,000 units cameras.

YDS provides OEM, ODM design, contract manufacturing, and builds the camera products. You may provide the requirements to us, even with a hand draft, our sales and engineering work together to meet your needs. We consider ourselves your last-term partner in developing practical and innovative solutions.

Our team covers everything from initial concept development to mass produced product. YDS specializes in customized camera design, raw material, electronic engineering, firmware/software development, product testing, and packing design. Our experienced strategic supply systems offer a robust and dependable manufacturing capacity for orders of various sizes.



Limited Warranty

YDS provides the following limited warranty if you purchased the Product(s) directly from YDS company or from YDS's website www.YDSCAM.com. Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. YDS guarantees that the Product(s) will be free from defects in materials and workmanship under normal use for a period of one (1) year from the date you receive the product ("Warranty Period").

For all Product(s) that contain or develop material defects in materials or workmanship during the Warranty Period, YDS will, at its sole option, either: (i) repair the Product(s); (ii) replace the Product(s) with a new or refurbished Product(s) (replacement Product(s) being of identical model or functional equivalent); or (iii) provide you a refund of the price you paid for the Product(s).

This Limited Warranty of YDS is solely limited to repair and/or replacement on the terms set forth above. YDS is not reliable or responsible for any subsequent events.



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YDS Strength

Powerful Factory



Professional Service



Promised Delivery



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