

## YDS-A9MA-OV5640-1B V1.4

### 5MP OmniVision OV5640-1B MIPI Interface LED Auto Focus Camera Module



Front View



Back View

#### Specifications

Camera Module No.	YDS-A9MA-OV5640-1B V1.4
Resolution	5MP
Image Sensor	OV5640-1B
Sensor Type	1/4"
Pixel Size	1.4 um x 1.4 um
EFL	3.29 mm
F.NO	2.80
Pixel	2592 x 1944
View Angle	68.7°(DFOV) 58.1°(HFOV) 45.0°(VFOV)
Lens Dimensions	8.50 x 8.50 x 5.05 mm
Module Size	153.25 x 12.00 mm
Module Type	Auto Focus with LED
Interface	MIPI
Auto Focus VCM Driver IC	Embedded
Lens Model	YDS-LENS-M5101
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +70°C
Mating Connector	502426-4010



# YDS CAMERA MODULE

*your best camera partner*

## YDS-A9MA-OV5640-1B V1.4 5MP OmniVision OV5640-1B MIPI Interface LED Auto Focus Camera Module



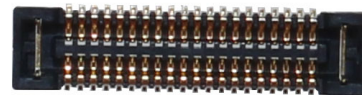
Top View



Side View



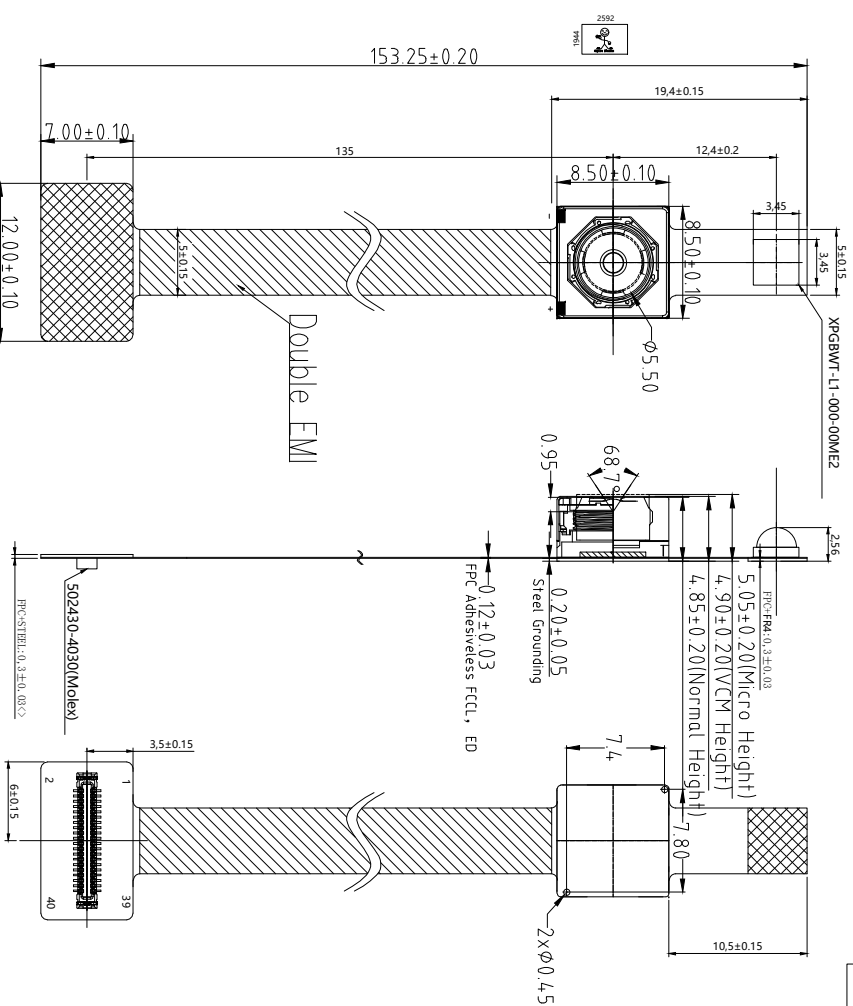
Bottom View



Mating Connector

Version	Information	Date
V1.0	First Version	3-12-2018
V1.2	Change lens and VCM	6-28-2021
V1.4	Change LED	9-8-2021

PIN	SIGNAL
1	AGND
2	AF_GND
3	STROBE
4	AF_VDD2.8V
5	SDA
6	NC
7	SCL
8	AVDD2.8V
9	NC
10	NC
11	NC
12	NC
13	NC
14	NC
15	NC
16	MDP1
17	PWDN
18	MDN1
19	NC
20	DGND
21	NC
22	MCP
23	NC
24	MGN
25	NC
26	DGND
27	NC
28	MDP0
29	NC
30	MDN0
31	FREX
32	DGND
33	NC
34	MCLK
35	NC
36	DVDD1.5V
37	NC
38	DOVDD1.8V
39	LED+
40	LED-



TOP VIEW

SIDE VIEW

BOTTOM VIEW

Parameter:

1、Sensor specification:

Image Sensor: OV5640-1B

Pixel:  $1.4\mu\text{m} \times 1.4\mu\text{m}$

Lens Type: 1/4

Important Voltage Description: DVDD1.5V

(external power supply);

2、Lens specification:

FOV:  $68.7^\circ(\text{D}), 58.1^\circ(\text{H}), 4.5^\circ(\text{V})$

F/NO: 2.8

TV distortion:  $< 1.0\%$

Focal length: 3.29mm

Composition: 4P+IR FILTER

IR Cut Coating:  $650\text{nm} \pm 10\text{nm} @ 50\%$

Designed By

Kevin

Model Name:

A9MA-0V5640-1B V1.4

Checked By

Aouly\_Yan

Projection Type:

Unit: mm

Material:

Scale: 1:1

Sheet: 1 of 1

Version: 1/0

A

B

C

D

E

3

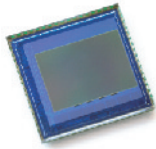
2

1

3

2

1



# OV5640 5-megapixel product brief



## 1/4-inch, 5-Megapixel SOC Image Sensor Optimized for High-Volume Mobile Markets



available in  
a lead-free  
package

The OV5640 delivers a complete 5-megapixel camera solution on a single chip, aimed at offering cost efficiencies that serve the high-volume autofocus (AF) camera phone market. The system-on-a-chip (SOC) sensor features OmniVision's 1.4 micron OmniBSI™ backside illumination architecture to deliver excellent pixel performance and best-in-class low-light sensitivity, while enabling ultra compact camera module designs of 8.5 mm x 8.5 mm with <6 mm z-height. The OV5640 provides the full functionality of a complete camera, including anti-shake technology, AF control, and MIPI while being easier to tune than two-chip solutions, making it an ideal choice in terms of cost, time-to-market and ease of platform integration.

The OV5640 enables 720p HD video at 60 frames per second (fps) and 1080p HD video at 30 fps with complete user control over formatting and output data transfer. The 720p/60 HD video is captured in full field of view (FOV) with 2 x 2 binning, which doubles the sensitivity and improves the signal-to-noise ratio (SNR). Additionally, a unique post-binning re-sampling filter function removes zigzag artifacts around slant edges and minimizes spatial artifacts to deliver even sharper, crisper

color images. To further improve camera performance and user experience, the OV5640 features an internal anti-shake engine for image stabilization, and it supports Scalado™ tagging for faster image preview and zoom.

The OV5640 offers a digital video port (DVP) parallel interface and a high-speed dual lane MIPI interface, supporting multiple output formats. An integrated JPEG compression engine simplifies data transfer for bandwidth-limited interfaces. The sensor's automatic image control functions include automatic exposure control (AEC), automatic white balance (AWB), automatic band filter (ABF), 50/60 Hz automatic luminance detection, and automatic black level calibration (ABLC). The OV5640 delivers programmable controls for frame rate, AEC/AGC 16-zone size/position/weight control, mirror and flip, cropping, windowing, and panning. It also offers color saturation, hue, gamma, sharpness (edge enhancement), lens correction, defective pixel canceling, and noise canceling to improve image quality.

Find out more at [www.ovt.com](http://www.ovt.com).

## applications

- cellular phones
- toys
- PC multimedia
- digital still cameras

## ordering information

- **OV05640-A71A-1B** (color, lead-free)  
71-pin CSP

## features

- 1.4  $\mu\text{m}$  x 1.4  $\mu\text{m}$  pixel with OmniBSI technology for high performance (high sensitivity, low crosstalk, low noise, improved quantum efficiency)
- optical size of 1/4"
- automatic image control functions: automatic exposure control (AEC), automatic white balance (AWB), automatic band filter (ABF), automatic 50/60 Hz luminance detection, and automatic black level calibration (ABLC)
- programmable controls for frame rate, AEC/AGC 16-zone size/position/weight control, mirror and flip, cropping, windowing, and panning
- image quality controls: color saturation, hue, gamma, sharpness (edge enhancement), lens correction, defective pixel canceling, and noise canceling
- support for output formats: RAW RGB, RGB565/555/444, CCIR656, YUV422/420, YCbCr422, and compression
- support for video or snapshot operations
- support for internal and external frame synchronization for frame exposure mode
- support for LED and flash strobe mode
- support for horizontal and vertical sub-sampling, binning
- support for minimizing artifacts on binned image
- support for data compression output
- support for anti-shake
- standard serial SCCB interface
- digital video port (DVP) parallel output interface and dual lane MIPI output interface
- embedded 1.5V regulator for core power
- programmable I/O drive capability, I/O tri-state configurability
- support for black sun cancellation
- support for images sizes: 5 megapixel, and any arbitrary size scaling down from 5 megapixel
- support for auto focus control (AFC) with embedded AF VCM driver
- embedded microcontroller
- suitable for module size of 8.5 x 8.5 x <6mm with both CSP and RW packaging

## key specifications (typical)

- **active array size:** 2592 x 1944
- **power supply:**  
core: 1.425 ~ 1.675V (with embedded 1.5V regulator)  
analog: 2.6 ~ 3.0V (2.8V typical)  
I/O: 1.8V / 2.8V
- **power requirements:**  
active: 140 mA  
standby: 20  $\mu\text{A}$
- **temperature range:**  
operating: -30°C to 70°C junction temperature (see [table 8-2](#))  
stable image: 0°C to 50°C junction temperature (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
- **max S/N ratio:** 36 dB
- **dynamic range:** 68 dB @ 8x gain
- **maximum image transfer rate:**  
QSXGA (2592x1944): 15 fps  
1080p: 30 fps  
1280x960: 45 fps  
720p: 60 fps  
VGA (640x480): 90 fps
- **sensitivity:** 600 mV/Lux-sec
- **shutter:** rolling shutter / frame exposure
- **maximum exposure interval:** 1964 x  $t_{\text{ROW}}$
- **pixel size:** 1.4  $\mu\text{m}$  x 1.4  $\mu\text{m}$
- **dark current:** 8 mV/s @ 60°C junction temperature
- **image area:** 3673.6  $\mu\text{m}$  x 2738.4  $\mu\text{m}$
- **package dimensions:** 5985  $\mu\text{m}$  x 5835  $\mu\text{m}$

## YDS-LENS-M5101

SPECIFICATION		
1. SENSOR SIZE	1/4" (5M CSP)	
2. MAX IMAGE CIRCLE	φ4.90mm	
3. TOTAL TRACK	4.18±0.1mm	
4. BFL	3.29mm	
5. OPTICAL BFL	1.43mm	
6. MECHANICAL BFL	0.85mm	
7. F/NO	2.8±5%	
8. VIEW OF FIELD	VERTICAL	45.0° (γ=1.36)
	HORIZONTAL	58.1° (γ=1.814)
	DIAGONL	68.7° (γ=2.268)
9. OPTICAL DISTORTION	<1.0%	
10. TV DISTORTION	<1.0%	
11. RELATIVE ILLUMINATION	>42.3%	
12. CONSTRUCTION	4F+IR FILTER	
13. CHIEF RAY ANGLE	<25°	
14. CUT FREQUENCY AT 50%	650±10nm	
15. THREAD	M6.0X0.35P	
16. IMAGE QUALITY	AXIS	330lp/mm
	0.7Y	200lp/mm
17. APPEARANCE QUALITY (Scratch/Di <sub>2</sub> )	CENTER	20/10
	EDGE	40/20

NO	MODIFY CONTENT	NAME	DATE	ANGLE	DIM	TYPE	UNIT	MATERIAL	SCALE	SURFACE	FINISH	REVISION
1									8:1			
2												
3												
4												

**NOTE:**

1. 镜头表面不可有油污、灰尘、毛丝等异物。
2. 镜头配VCM锁附高度为 4.7±0.1mm, 扭力为20—60gf.cm。
3. 镜头承受推力为≥2.0kg。
4. 镜头品质参数需符合图中要求。

The drawing shows a lens with a diameter of 5.40mm and a central hole of 4.7mm. The front view shows chamfered edges with R0.15 radii and 4-45 degree chamfers. The side view shows a total thickness of 4.18±0.10mm, with an optical BFL of 1.43mm and a mechanical BFL of 0.85mm. The lens has a 73°(MAX) field of view and a 68.7°(D) diagonal field of view. It features an IR CUT filter and an IMAGE PLANE. Mounting dimensions include a 0.89(MAX) distance from the center to the top edge and a 0.95(D) distance from the center to the bottom edge. A 1.30mm distance is shown from the center to the bottom edge of the lens body. The lens is mounted on an M6.0X0.35P thread.

**PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION**

**Part Number:** [5024264010](#)  
**Status:** **Active**  
**Overview:** SlimStack™ 0.40mm Pitch Board-to-Board Connectors  
**Description:** 0.40mm Pitch SlimStack™ Board-to-Board Receptacle, Surface Mount, Dual Row, Vertical, 1.00mm Stacking Height, with Solder Tabs, 40 Circuits

**Documents:**

[3D Model](#) [RoHS Certificate of Compliance \(PDF\)](#)  
[Drawing \(PDF\)](#)

**General**

Product Family	PCB Receptacles
Series	<a href="#">502426</a>
Application	Board-to-Board, Signal
Overview	<a href="#">SlimStack™ 0.40mm Pitch Board-to-Board Connectors</a>
Product Name	SlimStack™
UPC	800756676784

**Physical**

Circuits (Loaded)	40
Circuits (maximum)	40
Color - Resin	Black
Durability (mating cycles max)	30
Glow-Wire Compliant	No
Lock to Mating Part	Yes
Mated Height	1.00mm
Material - Metal	Phosphor Bronze
Material - Plating Mating	Gold
Material - Plating Termination	Gold
Net Weight	40.511/mg
Number of Rows	2
Orientation	Vertical
PCB Locator	No
PCB Retention	Yes
Packaging Type	Embossed Tape on Reel
Pitch - Mating Interface	0.40mm
Polarized to Mating Part	No
Polarized to PCB	No
Stackable	No
Temperature Range - Operating	-25°C to +85°C
Termination Interface: Style	Surface Mount

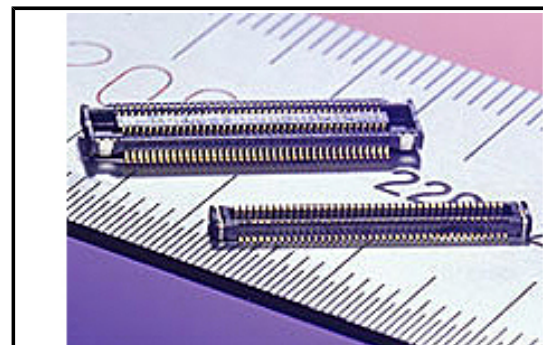
**Electrical**

Current - Maximum per Contact	0.3A
Voltage - Maximum	50V AC/DC

**Material Info**

**Reference - Drawing Numbers**

Sales Drawing [SD-502426-001](#), [SD-502426-002](#)



*Series image - Reference only*

**EU ELV**

**Not Relevant**

**EU RoHS**

**Compliant**

**REACH SVHC**

Not Contained Per -  
ED/21/2016 (20 June  
2016)

**Halogen-Free**

**Status**

**Low-Halogen**

**Need more information on product  
environmental compliance?**

Email [productcompliance@molex.com](mailto:productcompliance@molex.com)  
Please visit the [Contact Us](#) section for any  
non-product compliance questions.

China ROHS

ELV

Green Image

Not Relevant

**Search Parts in this Series**

[502426](#) Series

**Mates With**

[502430](#) PCB Header







# YDS CAMERA MODULE

*your best camera partner*

## 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								
FREX	frame exposure / mechanical shutter								
GPIO	general purpose inputs								
SLASEL	I2C slave address select								
AFEN	CEN chip enable active high on VCM driver IC								
<b>MIPI Interface</b>									
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				
<b>DVP Parallel Interface</b>									
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

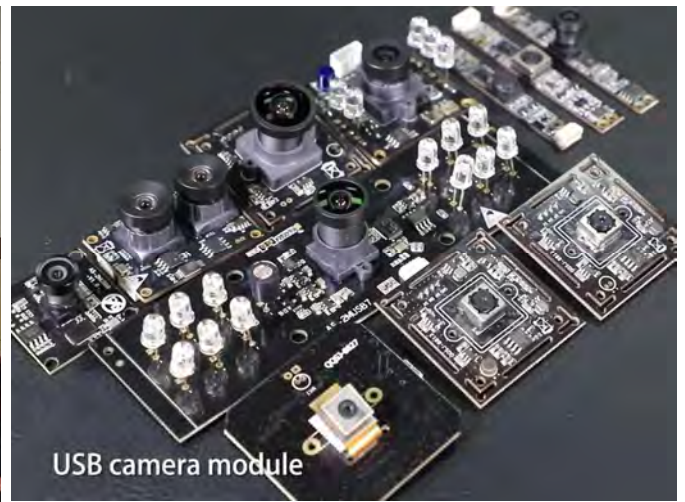
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## Company YDSCAM

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](http://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 CAMERA MODULE

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## YDS Strength

### Powerful Factory



### Professional Service



### Promised Delivery



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