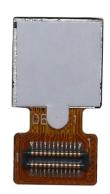


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# YDS-OV5645-Y660B V3.1 5MP OmniVision OV5645 MIPI Interface Auto Focus Camera Module





Front View Back View

#### **Specifications**

Camera Module No.	YDS-OV5645-Y660B V3.1	
Resolution	5MP	
Image Sensor	OV5645	
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 5.17 mm	
Module Size	15.90 x 8.50 mm	
Module Type	Auto Focus	
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	BBR43-24KB533	



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# YDS-OV5645-Y660B V3.1 5MP OmniVision OV5645 MIPI Interface Auto Focus Camera Module







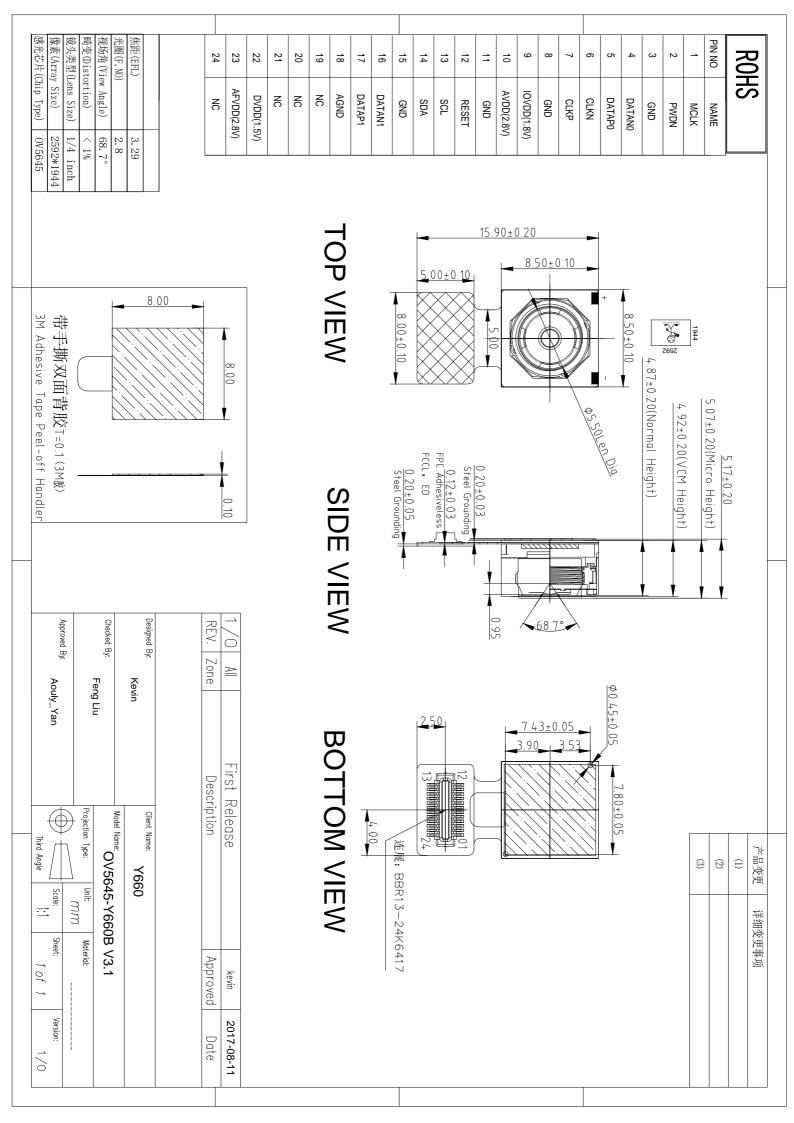
Side View



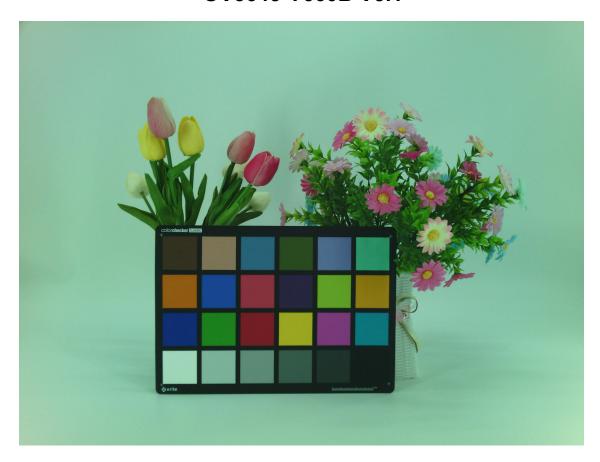
**Bottom View** 

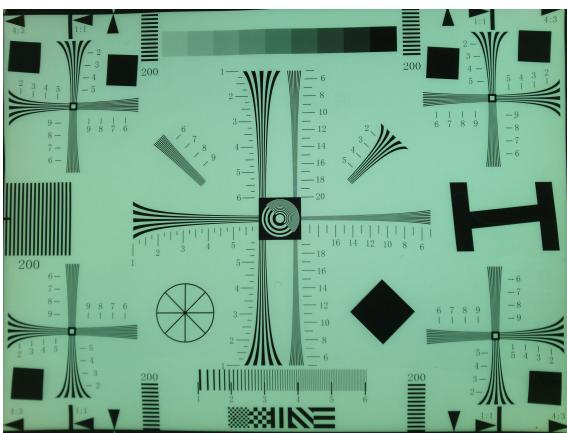


**Mating Connector** 

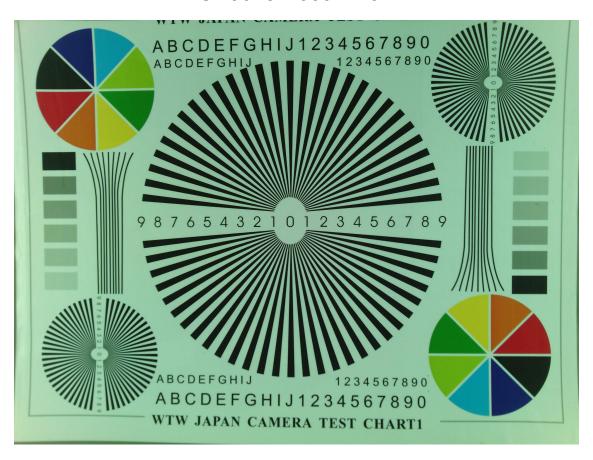


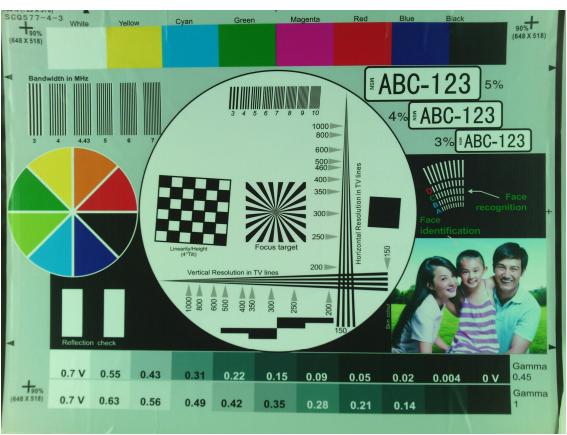
### Real Test Images OV5645-Y660B V3.1



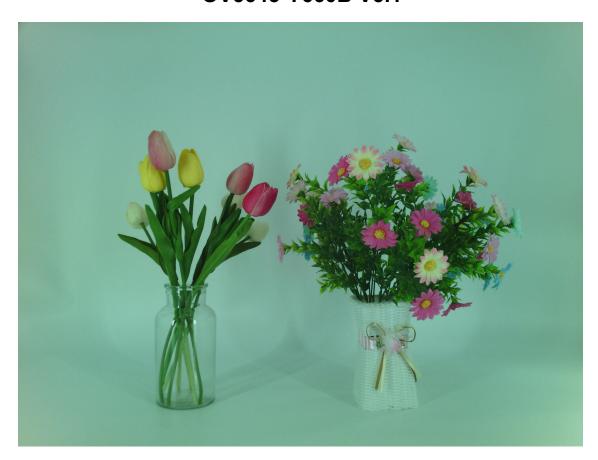


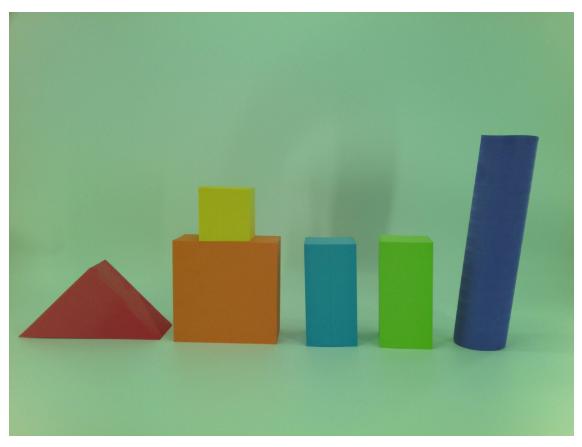
### Real Test Images OV5645-Y660B V3.1





### Real Test Images OV5645-Y660B V3.1







# OV5645 5-megapixel product brief





available in a lead-free package

# High Quality 5-Megapixel Photography and HD Video for Low-Cost Mobile Devices

OmniVision's OV5645 is a high performance, 5-megapixel system-on-chip (SOC) ideally suited for the cost-sensitive segment of the mobile handset market. The CameraChip™ sensor's single MIPI port replaces both a bandwidth-limited DVP interface and a costly embedded JPEG compressor, allowing the new OV5645 sensor to save significant silicon area and cost. An embedded autofocus control with voice coil motor driver offers further cost savings for the end user, making the OV5645 a highly attractive alternative to other 5-megapixel sensors currently on the market.

The OV5645 also features a new picture-in-picture (PIP) architecture that offers an easy-to-implement, low-cost dual camera system solution for mobile handsets and smartphones. The feature is based on a master/slave configuration where a front-facing camera (OV7965) can be connected through the OV5645 master camera, enabling a two-camera system with PIP functionality without the need for an additional MIPI interface into the baseband processor.

Built on OmniVision's 1.4-micron OmniBSI™ pixel architecture, the OV5645 offers high performance 5-megapixel photography and 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 sensor's 720p HD video is captured in full field-of-view with 2 x 2 binning, which doubles the sensitivity and improves the signal-to-noise ratio (SNR). 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.

Find out more at www.ovt.com.



#### **Applications**

- Cellular Phones
- Toys

- PC Multimedia
- Digital Still Cameras

#### **Product Features**

- 1.4 µm x 1.4 µm 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 blacklevel calibration (ABLC) udual lane MIPI output interface
- lacktriangle image quality controls: color saturation, lacktriangle embedded 1.5 V regulator for core hue, gamma, sharpness (edge enhancement), lens correction, defective pixel canceling, and noise canceling
- support for output formats: RAW RGB, RGB565/555/444, YUV422/420, YCbCr422
- support for video or snapshot operations
- support for internal and external frame synchronization for frame exposure
- 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

- 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  $8.5 \times 8.5 \times 6$ mm with both CSP and RW packaging

### OV5645



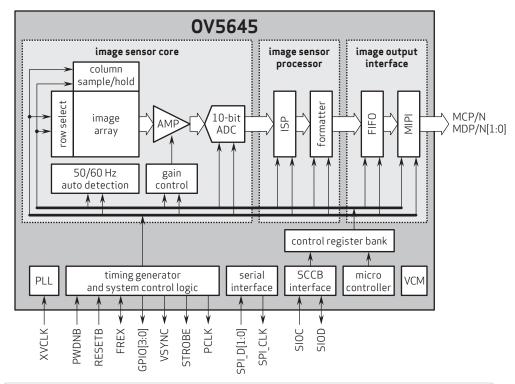
- 0V05645-A66A (color, lead-free, 66-pin CSP3)
- 0V05645-G04A (color, chip probing, 200 µm backgrinding, reconstructed wafer)

#### **Product Specifications**

- active array size: 2592 x 1944
- power supply: core: 1.5V ±5%
- (with embedded 1.5 regulator) analog: 2.6 3.0V (2.8V typical) I/O: 1.8V / 2.8V
- temperature range:
   operating: -30°C to 70°C junction temperature
- stable image: 0°C to 50°C junction
- output formats: 8-/10-bit RGB RAW, RGB565/555/444, YUV422/420, YCbCr422 output
- lens size: 1/4"
- lens chief ray angle: 29.1°

- input clock frequency: 6 27 MHz
- max S/N ratio: 36 dB
- maximum image transfer rate:
   QSXGA (2592X1944): 15 fps
- 1080p: 30 fps
- 1280x960: 45 fps - **720p:** 60 fps
- shutter: rolling shutter / frame exposure
- maximum exposure interval: 1964 x t<sub>ROW</sub>
- $\blacksquare$  pixel size: 1.4  $\mu$ m  $\times$  1.4  $\mu$ m
- image area: 3673.6 µm x 2738.4 µm
- package/die dimensions:
   CSP3: 6200 μm x 4860 μm
   COB: 6190 μm x 4850 μm

### Functional Block Diagram



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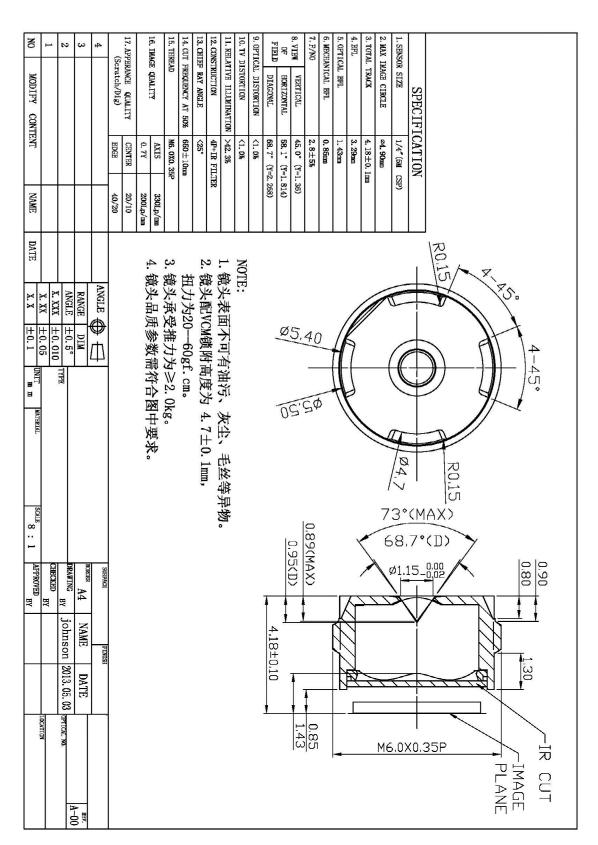
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#### YDS-LENS-M5101



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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				
FREX	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	3				
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 positive 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 D00 Y0	DVP data output port 0				
D1 D01 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 D06 Y6	DVP data output port 6				
D7 D07 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 D011 Y11	DVP data output port 11				
ווו ווטס ווס	DVI data output port 11				



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#### **Cameras Applications**





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#### **Camera Reliability Test**

Reliability Inspection Item		Tanking Makhad	A Criteria		
Category		Item	Testing Method	Acceptance Criteria	
Environmental	Storage	High 60°C 96 Hours	Temperature Chamber	No Abnormal Situation	
	Temperature	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	
Dhyaisal	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	
Physical		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**

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Inspection Item					
Category		Item	Inspection Method	Standard of Inspection	
	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)	
		Scratches	The Naked Eye	The Inside Crack Exposure is Not Allowed	
	Holder -	Gap	The Naked Eye	Meet the Height Standard	
Appearance		Screw	The Naked Eye	Make Sure Screws Are Presented (If Any)	
		Damage	The Naked Eye	The Inside Crack Exposure is Not Allowed	
		Scratch	The Naked Eye	No Effect On Resolution Standard	
	Lens -	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.	
		No Communication	Test Board	Not Allowed	
	Image	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	
Function		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	
		Height	The Naked Eye	Follows Approval Data Sheet	
Dimension		Width	The Naked Eye	Follows Approval Data Sheet	
		Length	The Naked Eye	Follows Approval Data Sheet	
		Overall	The Naked Eye	Follows Approval Data Sheet	



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### **YDSCAM Package Solutions**

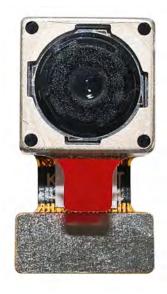
YDS Camera Module



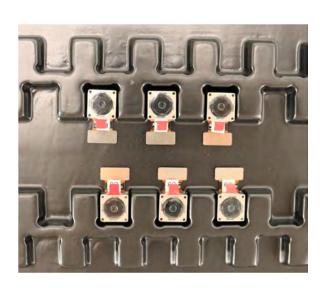
Tray with Grid and Space



Complete with Lens Protection Film



Place Cameras on the Tray





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### **YDSCAM Package Solutions**

**Full Tray of Cameras** 



Place Tray into Anti-Static Bag



Cover Tray with Lid



Vacuum the Anti-Static Bag





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### **YDSCAM Package Solutions**

#### Sealed Vacuum Anti-Static Bag with Labels

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





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### **YDSCAM Package Solutions**

Place Foam Sheets Between Tray Bags



Place Foam Sheets and Trays into Box



Seal the Carbon Box



Foam Sheets are Larger Than Trays



Foam Sheets are Tightly Fitting in Box



Label the Carbon Shipping Box





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### **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







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### **YDSCAM Package Solutions**

Place Camera Sample into Anti-Static Bag





Label the Sample Bags





Place Samples into the Carbon Box



Place Connectors into Anti-Static Bag





Place Connectors into Reel



Place Connectors into the Carbon Box





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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 subsequential events.















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#### **YDS Strength**

#### **Powerful Factory**





#### **Professional Service**







**Promised Delivery** 











