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### YDS-J4K-OV2732 V4.1

## 2MP OmniVision OV2732 MIPI and DVP Parallel Interface Fixed Focus Camera Module





Front View

Back View

### **Specifications**

Camera Module No.	YDS-J4K-OV2732 V4.1	
Resolution	2MP	
Image Sensor	OV2732	
Sensor Type	1/4"	
Pixel Size	2.0 um x 2.0 um	
EFL	3.29 mm	
F.NO	2.80	
Pixel	1920 x 1080	
View Angle	68.7°(DFOV) 58.1°(HFOV) 45.0°(VFOV)	
Lens Dimensions	8.00 x 8.00 x 5.00 mm	
Module Size	25.00 x 12.50 mm	
Module Type	Fixed Focus	
Interface	MIPI and DVP Parallel	
Auto Focus VCM Driver IC	None	
Lens Model	YDS-LENS-M5101	
Lens Type	650nm IR Cut	
Operating Temperature	-40°C to +85°C	
Mating Connector	FH12-24S-0.5SH	



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## 2MP OmniVision OV2732 MIPI and DVP Parallel Interface Fixed Focus Camera Module



Top View



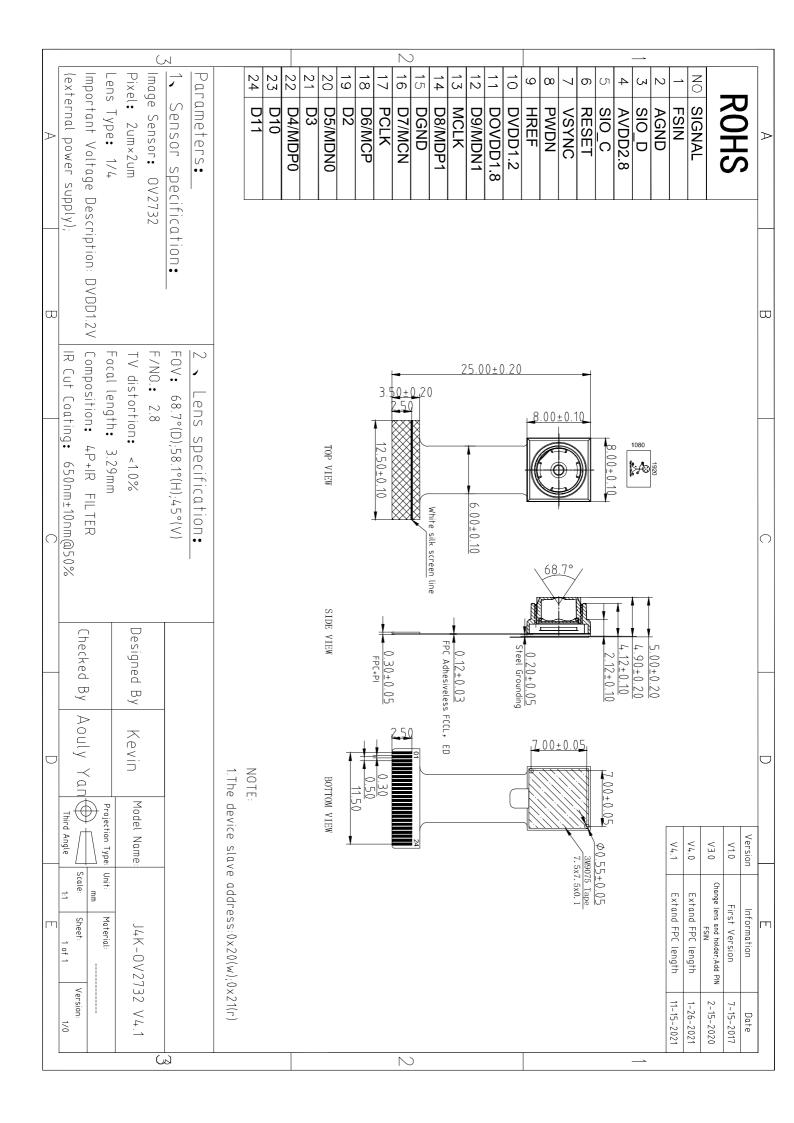
Side View

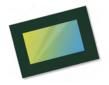


**Bottom View** 



**Mating Connector** 





## OV2732 1080p product brief





#### available in a lead-free package

# Low-Power 1080p High Definition PureCel® Sensor for Security Applications

OmniVision's OV2732 is a compact and power-efficient PureCel\* image sensor designed for IoT-based residential and commercial monitoring systems. The OV2732 captures quality images and videos with staggered high dynamic range (HDR), ensuring excellent scene reproduction in all lighting environments. The sensor features frame sync for use in multi-camera or 360-degree camera systems and supports ultra-low power mode (ULPM) and an ambient light sensor (ALS), making it particularly well-suited for battery-powered security applications.

Built on OmniVision's PureCel® technology, the 1/4-inch OV2732 captures 1080p high definition (HD) video at 60 frames per second (fps), 720p HD video at 90 fps, and VGA resolution video at 120 fps. The OV2732 delivers crisp images and video, even in challenging low-light conditions.

Find out more at www.ovt.com.





### **Applications**

- Internet of Things (IoT)
- High-end Video Conferencing
- Security

- Lifestyle Camera
- Home Monitoring

### **Product Features**

- programmable controls:
  - gain exposure

  - frame rate
  - image size horizontal mirror
  - vertical flip

  - cropping windowing
- automatic image control functions:
   black level calibration (BLC)
- serial camera control bus (SCCB)
- defective pixel correction (DPC)
- digital video port (DVP) parallel output

- support for two lane MIPI interface (up to 800 Mbps)
- support for image sizes:
- 1080p @ 60 fps 720p @ 90 fps
- · VGA @ 120 fps
- QVGA @ 240 fps, and more
- support for light sensing mode (LSM)
- support for staggered 2 frame HDR
- support for black sun cancellation
- on-chip phase lock loop (PLL)

## OV2732



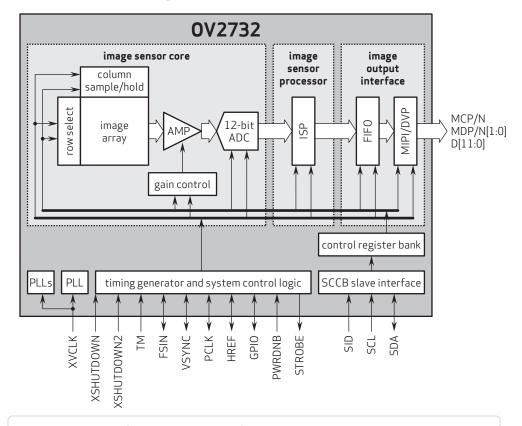
■ 0V02732-H57A (color, lead-free, 57-pin CSP4)

### **Product Specifications**

- active array size: 1920 x 1080
- power supply:
- core: 1.2\
- analog: 2.8V I/0: 1.8V
- power requirements: active: 110 mW
- temperature range: operating: -40°C to +85°C junction temperature
  - stable image: 0°C to +60°C junction temperature
- output interfaces: two-lane MIPI / DVP parallel
- output formats: 10/12-bit RAW RGB
- lens size: 1/4"
- lens chief ray angle: 12° linear

- input clock frequency: 6 27 MHz
- scan mode: progressive
- maximum image transfer rate:
  - **1080p:** 60 fps
- **720p**: 90 fps **VGA**: 120 fps
- QVGA: 240 fps
- shutter: rolling shutter
- maximum exposure interval: 1184 × t<sub>ROW</sub>
- pixel size: 2 µm x 2 µm
- image area: 3868 µm x 2190 µm
- package dimensions: 5174 µm x 3680 µm

### Functional Block Diagram



4275 Burton Drive Santa Clara, CA 95054

Tel: +1 408 567 3000 Fax: +1 408 567 3001 www.ovt.com

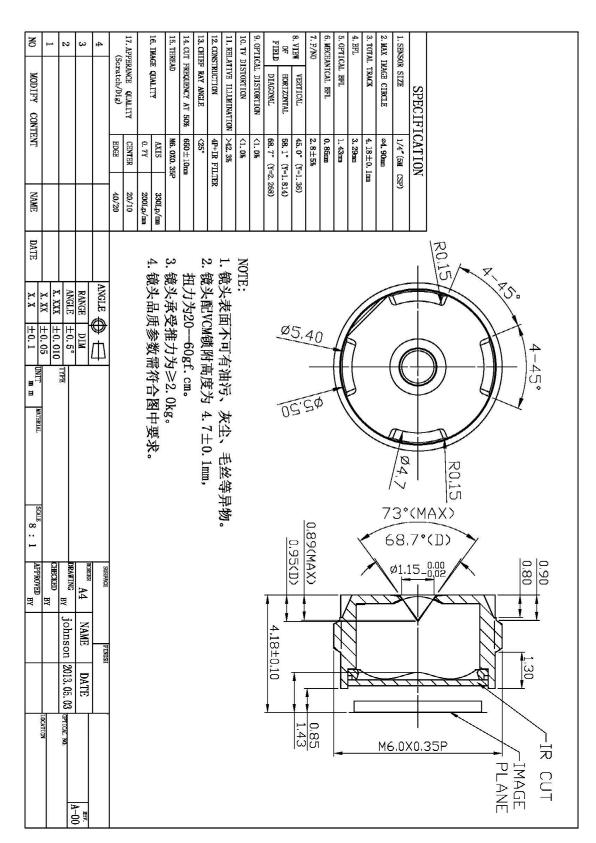
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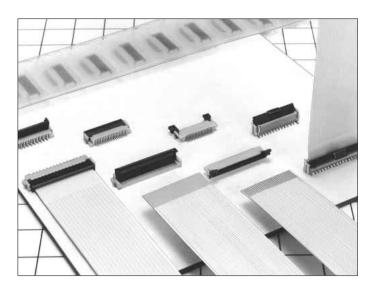
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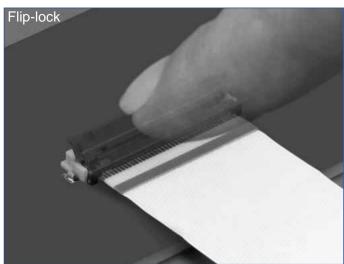
### YDS-LENS-M5101



### 0.5mm and 1mm Pitch Connectors For FPC/FFC

### FH12 Series





### ■Features

### 1. Ease of Use and Space Savings

Only one finger or 6.9N (Newtons) of force is required to lock Hirose's rotational actuator (flip-lock) as compared to using 2 fingers and 39.2N to close a FFC/FPC connector from our competition.

The Flip-Lock design also allows customers to place 2 or more connectors side by side as there is no need to waste additional board space for a side latch.

### 2. Strengthened Flip-lock Actuator

The standard Flip-Lock requires only 2.0mm height above the board. A strengthened lock lever is available which only requires an additional 0.4mm.

#### 3. Supports Thin FPC (0.18mm)

Hirose does not require double-sided FPC to have any additional strengthening plate or stiffener and can therefore support a thickness of as little as 0.18mm +/- 0.05.

#### 4. Hirose Ensures Reliability

Hirose's patented half tuning fork contacts maintain the required normal force without relying on the connector housing. With our competitor's conventional products the housing walls support the contact force, which does not provide for long-term reliability.

#### 5. Prevention of Solder Bridge

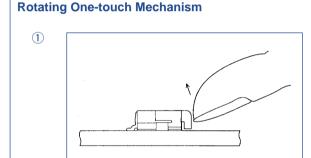
Excess solder cavity absorbs excessive solder and avoids solder bridging.

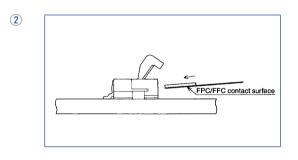
#### 6. Three different assembly types

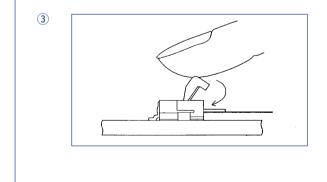
FH12 is offered in Top & Bottom Contact and Vertical Mount and offered in both a 0.5mm contact pitch as well as a 1.0mm contact pitch (bottom contact only).

### ■Applications

Notebook computers, printers, PDAs, digital cameras and other compact devices for interconnecting the main circuit board with the LCD, HDD or other device.







### **■**Product Specifications

	Current rating: 0.5A DC(Note 1)	Operating Temperature Range:-40 to +70°C (Note 2)	Storage Temperature Range:-10 to +50℃ (Note 3)
Rating	Voltage rating: 50V AC	Operating Humidity Range:Relative humidity, 90% max.	Storage Humidity Range:Relative humidity, 90% max.
		(Not dewed)	(Not dewed)

Applicable FPC	t=0.3±0.05 Gold plated	$t$ =0.18 $\pm$ 0.05 for FH12F- $*$ S-0.5SH			
Item	Specification	Conditions			
1. Insulation resistance	500M ohms minimum	100V DC			
2. Withstanding voltage	No flashover or insulation breakdown.	150V AC/1 minute			
3. Contact resistance	50m ohms maximum	1mA			
4. Durability (Insertion/withdrawal)	Contact resistance: 50m ohms maximum No damage, cracks, or parts dislocation.	20 cycles			
5. Vibration	No electrical discontinuity of $1\mu s$ or more Contact resistance: 50m ohms maximum. No damage, cracks, or parts dislocation.	Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 directions.			
No electrical discontinuity of 1μs or more Contact resistance: 50m ohms maximum. No damage, cracks, or parts dislocation.		Acceleration of 490 m/s², 11 ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis.			
7. Humidity(Steady state)	Contact resistance: 50m ohms maximum. Insulation resistance: 50M ohms minimum. No damage, cracks, or parts dislocation.	96 hours at 40°C and humidity of 90% to 95%			
8. Temperature Cycle	Contact resistance: 50m ohms maximum. Insulation resistance: 50M ohms minimum. No damage, cracks, or parts dislocation.	Temperature: $-40^{\circ}C \rightarrow 15$ to $35^{\circ}C \rightarrow 85^{\circ}C \rightarrow 15$ to $35^{\circ}C$ , Time: $30 \rightarrow 5$ max. $\rightarrow 30 \rightarrow 5$ max. (minutes) 5 cycles			
9.Resistance to Soldering heat	No deformation of	Reflow: At the recommended temperature profile			

components affecting performance. Note 1: When passing the current through all of the contacts, use 70% of the current rating.

Note 2: Includes temperature rise caused by current flow.

Note 3: The term "storage" refers to products stored for long period of time prior to mounting and use. Operating Temperature Range and Humidity range covers nonconducting condition of installed connectors in storage, shipment or during transportation.

Manual soldering: 350±5℃ for 3 seconds

### ■Material

9. Resistance to Soldering heat

Part	Material	Finish	Remarks
Insulator	Polyamide, LCP(60 pos.)	Color : Beige	UL94V-0
Actuator	PPS	Color : Dark brown	0L94V-0
Contact	Phosphor bronze	Gold plated	
Metal Fittings	Brass	Tin plated	

### **■**Ordering Information

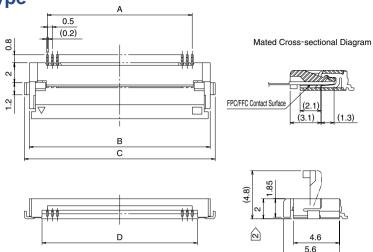
Series Name : FH12	Contact alignment: Single	
2 Blank : standard type	6 Eccentric direction:	
A : Top contact type	Blank : standard type	
S: Type with strengthed flip-lock actuator	A : Eccentric type	
F: Type with 0.18mm FPC End Thickness	Contacts Pitch : 0.5mm, 1mm	
3 Standard type : Number of contacts	Contact type	
Eccentric type : Number of contacts in 0.5mm housing	SH: SMT horizontal mounting type	
Standard type : Blank	SV : SMT vertical mounting type	
Eccentric type : Number of contacts	Plating specification	
	(55) : Gold plated	

### **◆** Series Configuration

Top Contact Type	Vertical mounting Type
non part.  FPC conductive	FPC conductive surface (bottom side)
FPC insertion to surface	
EU12A ** C 0 5 CU	FH12- ** S-0.5SV P.16
FH12A- ** S-0.5SH P.15  Number of contacts 10, 12,15, 16, 18, 20, 22, 24, 26, 28, 29, 30, 32, 33, 34, 36, 40, 42, 45, 50	FH12- ** S-0.5SV  Number of contacts 10, 12, 13, 15, 16, 17, 18, 20, 22, 24, 26, 30, 32, 33, 34, 36, 40, 45, 49, 50, 60
	FPC conductive surface (bottom side)
	FH12- ** S-1SV  Number of contacts 6, 7, 8, 16, 20, 22,  24

■0.5mm Pitch Bottom Contact Type





Unit:mm

	Part Number	CL No.	Number of Contacts	Α	В	С	D	RoHS
	FH12- 6S-0.5SH(55)	586-0582-5-55	6	2.5	6.1	7.1	3.57	
	FH12- 8S-0.5SH(55)	586-0744-5-55	8	3.5	7.1	8.1	4.57	
	FH12-10S-0.5SH(55)	586-0522-3-55	10	4.5	8.1	9.1	5.57	
	FH12-11S-0.5SH(55)	586-0600-5-55	11	5	8.6	9.6	6.07	
	FH12-12S-0.5SH(55)	586-0704-0-55	12	5.5	9.1	10.1	6.57	
	FH12-13S-0.5SH(55)	586-0549-0-55	13	6	9.6	10.6	7.07	
	FH12-14S-0.5SH(55)	586-0533-0-55	14	6.5	10.1	11.1	7.57	
	FH12-15S-0.5SH(55)	586-0523-6-55	15	7	10.6	11.6	8.07	
	FH12-16S-0.5SH(55)	586-0531-4-55	16	7.5	11.1	12.1	8.57	
	FH12-17S-0.5SH(55)	586-0606-1-55	17	8	11.6	12.6	9.07	
	FH12-18S-0.5SH(55)	586-0530-1-55	18	8.5	12.1	13.1	9.57	
	FH12-19S-0.5SH(55)	586-0534-2-55	19	9	12.6	13.6	10.07	
	FH12-20S-0.5SH(55)	586-0524-9-55	20	9.5	13.1	14.1	10.57	
	FH12-22S-0.5SH(55)	586-0532-7-55	22	10.5	14.1	15.1	11.57	YES
	FH12-24S-0.5SH(55)	586-0521-0-55	24	11.5	15.1	16.1	12.57	IES
	FH12-25S-0.5SH(55)	586-0692-3-55	25	12	15.6	16.6	13.07	
	FH12-26S-0.5SH(55)	586-0576-2-55	26	12.5	16.1	17.1	13.57	
	FH12-28S-0.5SH(55)	586-0612-4-55	28	13.5	17.1	18.1	14.57	
Note 2	FH12-30S-0.5SH(55)	586-0525-1-55	30	14.5	18.1	19.1	15.57	
	FH12-32S-0.5SH(55)	586-0681-7-55	32	15.5	19.1	20.1	16.57	
	FH12-33S-0.5SH(55)	586-0520-8-55	33	16	19.6	20.6	17.07	
	FH12-34S-0.5SH(55)	586-0617-8-55	34	16.5	20.1	21.1	17.57	
	FH12-35S-0.5SH(55)	586-0740-4-55	35	17.0	20.6	21.6	18.07	
	FH12-36S-0.5SH(55)	586-0526-4-55	36	17.5	21.1	22.1	18.57	
Note 2	FH12-40S-0.5SH(55)	586-0527-7-55	40	19.5	23.1	24.1	20.57	
Note 2	FH12-45S-0.5SH(55)	586-0528-0-55	45	22	25.6	26.6	23.07	
Note 2	FH12-50S-0.5SH(55)	586-0529-2-55	50	24.5	28.1	29.1	25.57	
Note 2	FH12-53S-0.5SH(55)	586-0595-7-55	53	26	29.6	30.6	27.07	

Note 1 : Embossed tape reel packaging (2,000 pieces/reel). Order by number of reels.

Note 2: If there is no problem with the connector height, we recommend the type with the strengthened Flip-lock actuator (FH12S-\*S-0.5SH).

Standard type connector height: 2 mm

Connector height of type with strengthened Flip-lock actuator: 2.4 mm



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### **Camera Module Pinout Definition Reference Chart**

OmniVision Sony Samsung On-Semi Ap	otina 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 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 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  Category Item		Tanking Makhad	Acceptance Critoria	
		Item	Testing Method	Acceptance Criteria
	Storage	High 60°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Temperature	Low -20°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Operation	High 60°C 24 Hours	Temperature Chamber	No Abnormal Situation
Environmental	Temperature	Low -20°C 24 Hours	Temperature Chamber	No Abnormal Situation
Environmental	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
	Drop Test	Without Package 60cm	10 Times on Wood Floor	Electrically Functional
	(Free Falling)	With Package 60cm	10 Times on Wood Floor	Electrically Functional
	Vibration Test	50Hz X-Axis 2mm 30min	Vibration Table	Electrically Functional
Physical		50Hz Y-Axis 2mm 30min	Vibration Table	Electrically Functional
Titysical		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
	Contact Discharge 2 KV		ESD Testing Machine	Electrically Functional
	ESD Test	Air Discharge 4 KV	ESD Testing Machine	Electrically Functional
Electrical	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 Category		ı Item	lana antina Mathard	Standard of Inspection	
		Item	Inspection Method		
		Color	The Naked Eye	Major Difference is Not Allowed.	
	FPC/ PCB	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	Holdel	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	
	Lens	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	
		Bright Pixel	Black Board	Not Allowed In the Image Center	
		Dark Pixel	White board	Not Allowed In the Image Center	
	Image	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	
Dimer	neion	Width	The Naked Eye	Follows Approval Data Sheet	
Dille	131011	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** 











