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# YDS-KM1-OV9712-1D V6.0 1MP OmniVision OV9712-1D DVP Parallel Interface Fixed Focus Camera Module



Front View Back View

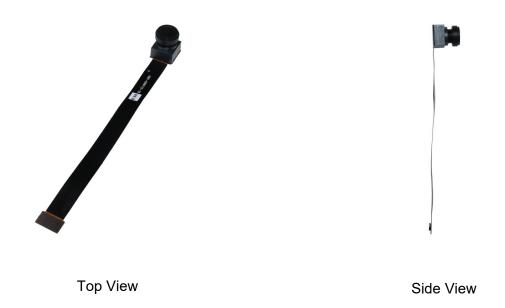
### **Specifications**

Camera Module No.	YDS-KM1-OV9712-1D V6.0		
Resolution	1MP		
Image Sensor	OV9712-1D		
Sensor Type	1/4"		
Pixel Size	3.0 um x 3.0 um		
EFL	2.33		
F.NO	2.80		
Pixel	1280 x 800		
View Angle	120.0°(DFOV) 99.0°(HFOV) 55.0°(VFOV)		
Lens Dimensions	10.40 x 10.40 x 12.80 mm		
Module Size	100.00 x 10.40 mm		
Module Type	Fixed Focus		
Interface	DVP Parallel		
Auto Focus VCM Driver IC	None		
Lens Model	YDS-LENS-TRC-4021B1		
Lens Type	650nm IR Cut		
Operating Temperature	-30°C to +70°C		
Mating Connector	AXT524124		



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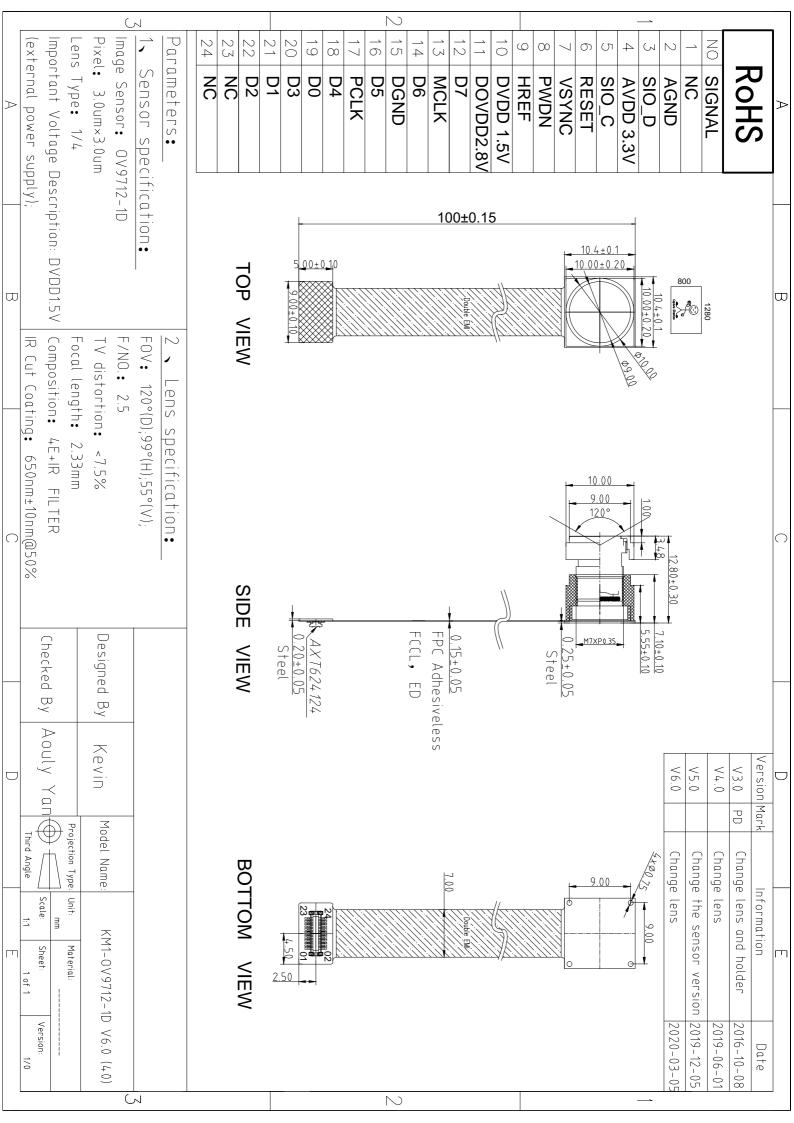
# YDS-KM1-OV9712-1D V6.0 1MP OmniVision OV9712-1D DVP Parallel Interface Fixed Focus Camera Module

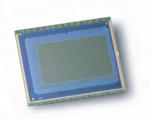




**Bottom View** 

**Mating Connector** 





# $0 V 9 7 1 2 \text{--} 1D_{\text{HD video image sensor product brief}}^{720p}$





#### available in a lead-free package

# The OV9712-1D Offers Best-in-Class 720p HD Video Performance at 30 Frames Per Second (fps)

Enabled by OmniVision's proprietary OmniPixel3-HS™ high sensitivity pixel technology with 3 x 3 µm pixel and low-light sensitivity of 3.7 V/lux-sec, the OV9712-1D provides vivid imaging in virtually every lighting condition from bright daylight to nearly complete darkness. OV9712-1D has been re-optimized to improve QE, sensitivity and SNR.

The 1/4-inch OV9712-1D sensor provides full-frame, sub-sampled or windowed 8-bit/10-bit images in raw RGB format via the digital video port and with complete user control over image quality, formatting and output data transfer. The OV9712-1D offers a chief ray angle (CRA) of 25°.

The OV9712-1D incorporates advanced image processing functions, including exposure control, gain control, white balance, lens correction and defective pixel correction, programmable through the serial camera control bus (SCCB) interface. For storage purposes, it includes one-time programmable (OTP) memory.

The OV9712-1D is available in a CSP package and is capable of operating within a temperature range of  $-30^{\circ}$ C to  $+70^{\circ}$ C.

Find out more at www.ovt.com.





### **Applications**

- Security
- Car DVR
- Notebooks
- Telepresence
- Mobile Phones

- Digital Still Cameras
- Webcams
- Medical
- Entertainment

### **Product Features**

- high sensitivity for low-light operation
- ultra low power and low cost
- automatic image control functions:
   automatic exposure control (AEC)
   automatic gain control (AGC)
- automatic white balance (AWB) automatic band filter (ABF)

- programmable controls:
  - frame rate AEC/AGC 16-zone size/position/ weight control
- flip windowing
- image quality controls:lens correction
  - defective pixel canceling
- output support for raw RGB

- supports image sizes:
- WXGA (1280x800)
- 640 x 400
- support for horizontal and vertical sub-sampling
- support for black sun cancellation
- automatic black level calibration (ABLC) standard serial camera control bus (SCCB) interface
  - digital video port (DVP) parallel output interface
  - embedded one-time programmable (OTP) memory
  - on-chip phase lock loop (PLL)
  - built-in 1.5V regulator for core

## 0V9712-1D



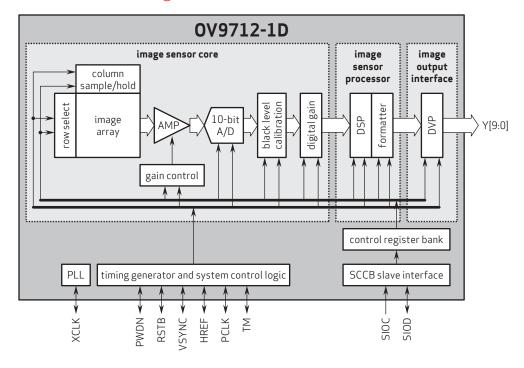
- 0V09712-V28A-1D (color, lead-free, 28-pin CSP)
- 0V09712-G04A-1D (color, chip probing, 200 µm backgrinding, reconstructed wafer)
- 0V09211-V28A (B&W, lead-free, 28-pin CSP)
- 0V09211-G04A
- (B&W, chip probing, 200  $\mu m$ backgrinding, reconstructed wafer)

### **Product Specifications**

- active array size: 1280 x 800
- power supply:core: 1.5 VDC ±5% (built-in regulator)analog: 3.0 3.6 VI/O: 1.7 3.6 V
- power requirements:active: 110 mW
- standby: 50 µA
- temperature range:operating: -30°C to +70°C junction temperature
  - stable image: 0°C to +50°C junction temperature
- output formats: 10-bit RAW RGB data
- lens size: 1/4"
- lens chief ray angle: 25° non-linear
- input clock frequency: 6 27 MHz

- scan mode: progressive
- maximum image transfer rate:WXGA (1280x800): 30 fps
  - -640 x 400:60 fps
- sensitivity: 3700 mV/Lux-sec
- max S/N ratio: 40 dB
- dynamic range: 69 dB @ 8x gain
- maximum exposure interval: 826 x t<sub>ROW</sub>
- pixel size: 3 µm x 3 µm
- image area: 3888 µm x 2430 µm
- package/die dimensions: CSP: 5415 µm x 4415 µm COB: 5430 µm x 4430 µm

### Functional Block Diagram



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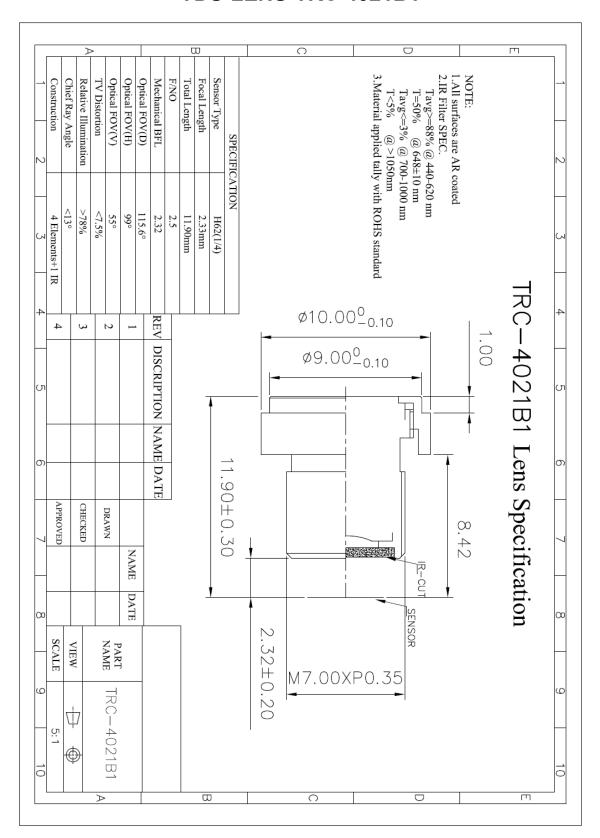
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### YDS-LENS-TRC-4021B1



# Panasonic

**NARROW-PITCH. THIN** AND SLIM CONNECTOR FOR BOARD-TO-FPC CONNECTION

NARROW PITCH (0.4 mm) CONNECTORS F4S SERIÉS

# ideas for life







### **Compliance with RoHS Directive**

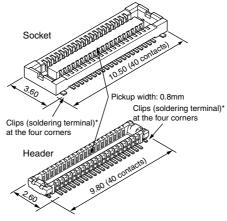
### **FEATURES**

1. Space-saving (3.6 mm widthwise) The required space is smaller than our

F4 series (40-contact type): Socket — 27% smaller,

Header — 38% smaller

The small size contributes to the miniaturization of target equipment.

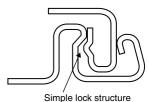


\* Clips for preventing the solder joints from being removed

#### 2. Highly reliable TDUGH CONTRCT has strong resistance to adverse environments.

(See Page 6 for details of the structure) Note: If extra resistance to shock caused by dropping is required, we recommend using our previous F4 Series.

3. The simple lock structure gives tactile feedback that ensures a superior mating/unmating operation feel.



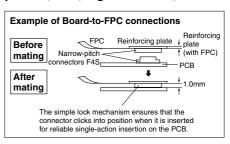
#### 4. Gull-wing type terminals

The gull-wing type terminals facilitate automatic mounting inspections.

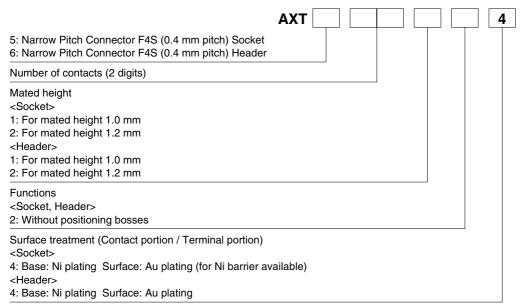
5. Connectors for inspection available Connectors for inspection are available that are ideal for modular unit inspection and inspection in device assembly processes.

### **APPLICATIONS**

Compact portable devices "Cellular phones, DVC, Digital cameras, etc"



#### ORDERING INFORMATION



Note: Please note that models with a mated height of 1.0 mm (7th digit of part number is "1") and 1.2 mm (7th digit of part number is "2") are not compatible.

### **AXT5**, 6

### PRODUCT TYPES \*TOUGH CONTACT

Made at the Solid	No mark and a sustained	Part n	umber	Pac	king
Mated height	Number of contacts	Socket	Header	Inner carton	Outer carton
	10	AXT510124	AXT610124		
	12	AXT512124	AXT612124		
	14	AXT514124	AXT614124	-	
	16	AXT516124	AXT616124		
	18	AXT518124	AXT618124		
	20	AXT520124	AXT620124		
	22	AXT522124	AXT622124		
	24	AXT524124	AXT624124		
	26	AXT526124	AXT626124		
	28	AXT528124	AXT628124		
	30	AXT530124	AXT630124		
	32	AXT532124	AXT632124	3,000 pieces	6,000 pieces
1.0mm	34	AXT534124	AXT634124		
1.0111111	36	AXT536124	AXT636124		
	38	AXT538124	AXT638124		
	40	AXT540124	AXT640124		
	42	AXT542124	AXT642124		
	44	AXT544124	AXT644124		
	46	AXT546124	AXT646124		
	48	AXT548124	AXT648124		
	50	AXT550124	AXT650124		
	54	AXT554124	AXT654124		
	60	AXT560124	AXT660124		
	64	AXT564124	AXT664124		
	70	AXT570124	AXT670124		
	80	AXT580124	0124 AXT680124		
	10	AXT510224	AXT610224		
	30	AXT530224	AXT630224		
1.2mm	40	AXT540224	AXT640224		
	50	AXT550224	AXT650224		
	80	AXT580224	AXT680224		

Notes: 1. Order unit: For mass production: in 1-inner-box (1-reel) units
Samples for mounting check: in 50-connector units. Please contact our sales office.

Samples: Small lot orders are possible. Please contact our sales office.

The above part numbers are for connectors without positioning bosses, which are standard. When ordering connectors with positioning bosses, please contact our sales office.
 Please contact us for connectors having a number of contacts other than those listed above.

### **SPECIFICATIONS**

### 1. Characteristics

	Item	Specifications	Conditions
	Rated current	0.3A/contact (Max. 5 A at total contacts)	
	Rated voltage	60V AC/DC	
Electrical characteristics	Breakdown voltage	150V AC for 1 min.	No short-circuiting or damage at a detection current of 1 mA when the specified voltage is applied for one minute.
onaraotonotico	Insulation resistance	Min. 1,000MΩ (initial)	Using 250V DC megger (applied for 1 min.)
	Contact resistance	Max. 90mΩ	Based on the contact resistance measurement method specified by JIS C 5402.
	Composite insertion force	Max. 0.981N/contacts × contacts (initial)	
Mechanical	Composite removal force	Min. 0.165N/contacts × contacts	
characteristics	Contact holding force (Socket contact)	Min. 0.49N/contacts	Measuring the maximum force. As the contact is axially pull out.
	Ambient temperature	-55°C to +85°C	No freezing at low temperatures. No dew condensation.
	Soldering heat resistance	Peak temperature: 260°C or less (on the surface of the PC board around the connector terminals)	Infrared reflow soldering
		300°C within 5 sec. 350°C within 3 sec.	Soldering iron
	Storage temperature	-55°C to +85°C (product only) -40°C to +50°C (emboss packing)	No freezing at low temperatures. No dew condensation.
Environmental characteristics	Thermal shock resistance (header and socket mated)	5 cycles, insulation resistance min. 100M $\Omega$ , contact resistance max. $90m\Omega$	Sequence 1. $-55.\frac{9}{3}$ °C, 30 minutes 2. $\sim$ , Max. 5 minutes 3. $85.\frac{9}{3}$ °C, 30 minutes 4. $\sim$ , Max. 5 minutes
	Humidity resistance (header and socket mated)	120 hours, insulation resistance min. 100M $\Omega$ , contact resistance max. $90m\Omega$	Bath temperature 40±2°C, humidity 90 to 95% R.H.
	Saltwater spray resistance (header and socket mated)	24 hours, insulation resistance min. 100M $\Omega$ , contact resistance max. 90m $\Omega$	Bath temperature 35±2°C, saltwater concentration 5±1%
	H <sub>2</sub> S resistance (header and socket mated)	48 hours, contact resistance max. 90mΩ	Bath temperature 40±2°C, gas concentration 3±1 ppm, humidity 75 to 80% R.H.
Lifetime characteristics	Insertion and removal life	50 times	Repeated insertion and removal speed of max. 200 times/ hours
Unit weight		20-contact type: Socket: 0.03 g Header: 0.01 g	

### 2. Material and surface treatment

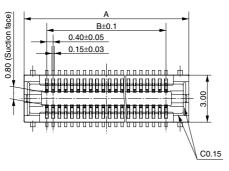
Part name	Material	Surface treatment
Molded portion	LCP resin (UL94V-0)	
Contact and Post	Copper alloy	Contact portion: Base: Ni plating Surface: Au plating Terminal portion: Base: Ni plating Surface: Au plating (except the terminal tips) The socket terminals close to the portion to be soldered have nickel barriers (exposed nickel portions).  Metal clips: Sockets: Base: Ni plating Surface: Pd+Au flash plating (except the terminal tips) Headers: Base: Ni plating Surface: Au plating (except the terminal tips)

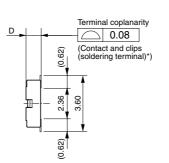
**DIMENSIONS** (Unit: mm)

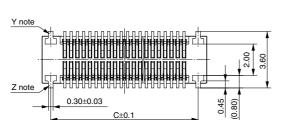
The CAD data of the products with a CAD Data mark can be downloaded from: http://panasonic-electric-works.net/ac

Socket (Mated height: 1.0 mm and 1.2 mm)









General tolerance: ±0.2

Mated height/ dimension	D
1.0mm	0.97
1.2mm	1.17

Dimension table (mm)

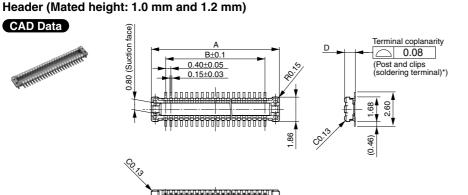
Number of contacts/ dimension	А		С
10	4.5	1.6	3.4
12	4.9	2.0	3.8
14	5.3	2.4	4.2
16	5.7	2.8	4.6
18	6.1	3.2	5.0
20	6.5	3.6	5.4
22	6.9	4.0	5.8
24	7.3	4.4	6.2
26	7.7	4.8	6.6
28	8.1	5.2	7.0
30	8.5	5.6	7.4
32	8.9	6.0	7.8
34	9.3	6.4	8.2
36	9.7	6.8	8.6
38	10.1	7.2	9.0
40	10.5	7.6	9.4
42	10.9	8.0	9.8
44	11.3	8.4	10.2
46	11.7	8.8	10.6
48	12.1	9.2	11.0
50	12.5	9.6	11.4
54	13.3	10.4	12.2
60	14.5	11.6	13.4
64	15.3	12.4	14.2
70	16.5	13.6	15.4
80	18.5	15.6	17.4

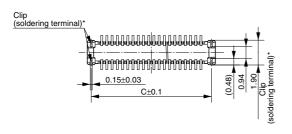
sections Y and Z are electrically connected.

Note: Since the clip (soldering terminal)\* has a single-piece construction,









General tolerance: ±0.2

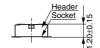
Mated height/ dimension	D
1.0mm	0.83
1.2mm	1.01

#### Dimension table (mm)

Number of contacts/ dimension	А	В	O
10	3.8	1.6	3.2
12	4.2	2.0	3.6
14	4.6	2.4	4.0
16	5.0	2.8	4.4
18	5.4	3.2	4.8
20	5.8	3.6	5.2
22	6.2	4.0	5.6
24	6.6	4.4	6.0
26	7.0	4.8	6.4
28	7.4	5.2	6.8
30	7.8	5.6	7.2
32	8.2	6.0	7.6
34	8.6	6.4	8.0
36	9.0	6.8	8.4
38	9.4	7.2	8.8
40	9.8	7.6	9.2
42	10.2	8.0	9.6
44	10.6	8.4	10.0
46	11.0	8.8	10.4
48	11.4	9.2	10.8
50	11.8	9.6	11.2
54	12.6	10.4	12.0
60	13.8	11.6	13.2
64	14.6	12.4	14.0
70	15.8	13.6	15.2
80	17.8	15.6	17.2

#### Socket and Header are mated





Mated height: 1.0 mm

Mated height: 1.2 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		Tanking Makhad	A coopto no Critorio		
Category		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	
Physical	(Free Falling)	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	
Titysical		50Hz Z-Axis 2mm 30min	Vibration Table	Electrically Functional	
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		ı Item	Lucy action Mathematical	Oten dead of languages
Category		Item	Inspection Method	Standard of Inspection
F		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
		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	Image	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



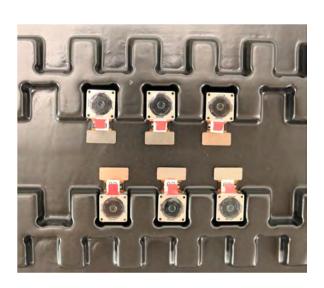
Tray with Grid and Space



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





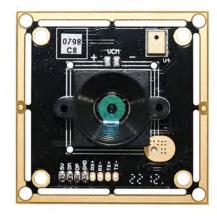
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### **YDSCAM Package Solutions**

**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.















your best camera partner

### **YDS Strength**

### **Powerful Factory**





**Professional Service** 







**Promised Delivery** 











