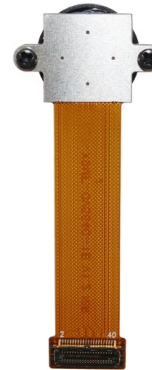


YDS-X9MF-OV5640-1B V1.2 NIR
5MP OmniVision OV5640-1B MIPI and DVP Parallel Interface
No IR Filter M12 Fixed Focus Camera Module



Front View



Back View

Specifications

Camera Module No.	YDS-X9MF-OV5640-1B V1.2 NIR
Resolution	5MP
Image Sensor	OV5640-1B
Sensor Type	1/4"
Pixel Size	1.4 um x 1.4 um
EFL	0.90 mm
F.NO	2.00
Pixel	2592 x 1944
View Angle	220.0°(DFOV) 187.0°(HFOV) 144.0°(VFOV)
Lens Dimensions	13.00 x 13.00 x 13.56 mm
Module Size	55.00 x 22.00 mm
Module Type	Fixed Focus
Interface	MIPI and DVP Parallel
Auto Focus VCM Driver IC	Embedded
Lens Model	YDS-LENS-TRC-F5022A6-02
Lens Type	No IR Filter Lens
Operating Temperature	-30°C to +70°C
Mating Connector	FX12B-40P-0.4SV



YDS-X9MF-OV5640-1B V1.2 NIR 5MP OmniVision OV5640-1B MIPI and DVP Parallel Interface No IR Filter M12 Fixed Focus Camera Module



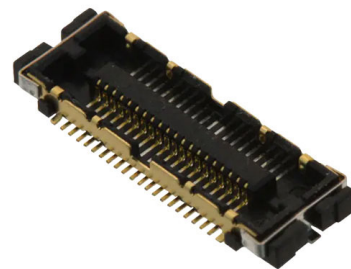
Top View



Side View



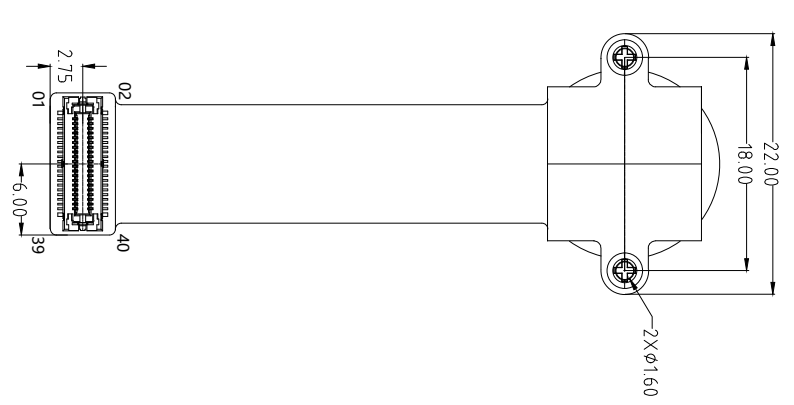
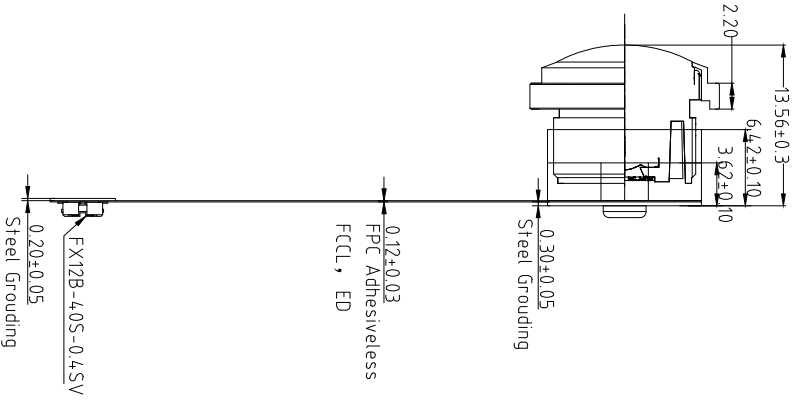
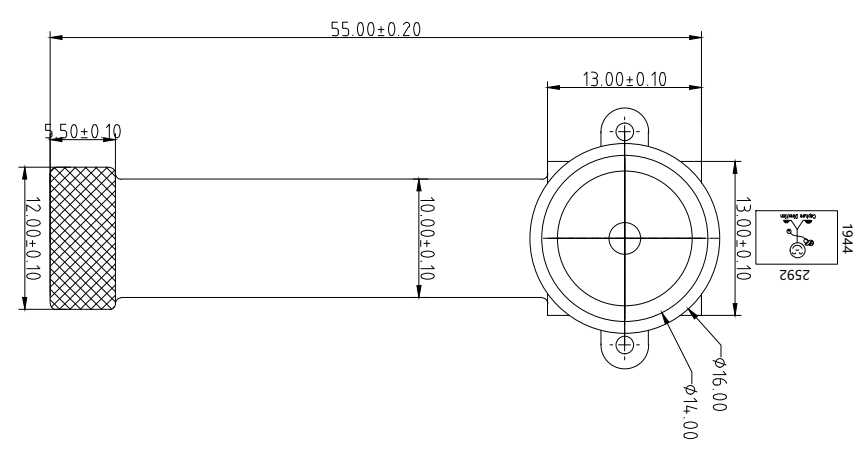
Bottom View



Mating Connector

Version	Information	Date
V1.2	First Version	7-12-2022

PIN	SIGNAL
1	AGND
2	NC
3	STROBE
4	NC
5	SIOD
6	NC
7	SIOC
8	AVDD2.8V
9	RESET
10	GPIO1
11	PCLK
12	GPIO0
13	VSYNC
14	FREX
15	HREF
16	D9/MDP1
17	PWDN
18	D8/MDN1
19	D9/MDP1
20	DGND
21	D8/MDN1
22	D7/MCP
23	D7/MCP
24	D6/MCN
25	D6/MCN
26	DGND
27	D5/MDP0
28	D5/MDP0
29	D4/MDN0
30	D4/MDN0
31	D3
32	DGND
33	D2
34	XCLK
35	D1
36	DVDD1.5V
37	D0
38	DOVDD1.8V
39	DGND
40	DGND



TOP VIEW

SIDE VIEW

BOTTOM VIEW

Parameter:

1、Sensor specification:

Image Sensor: OV5640
 Pixel: 1.4umx1.4um
 Lens Type: 1/4
 Important Voltage Description: DVDD1.5V (external power supply);

2、Lens specification:

FOV: 220°(D);187°(H);144°(V)
 F/NO.: 2.0
 TV distortion: <-16%
 Focal length: 0.9mm
 Composition: 1G4P (NO IR FILTER)

Designed By	Kevin	Model Name:	X9MF-OV5640-1B V1.2 NIR		
Checked By	Aouly_Yan	Projection Type:	Unit: mm	Material:	-----
		Third Angle	Scale: 1:1	Sheet: 1 of 1	Version: 1/0



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.

applications

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

ordering information

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

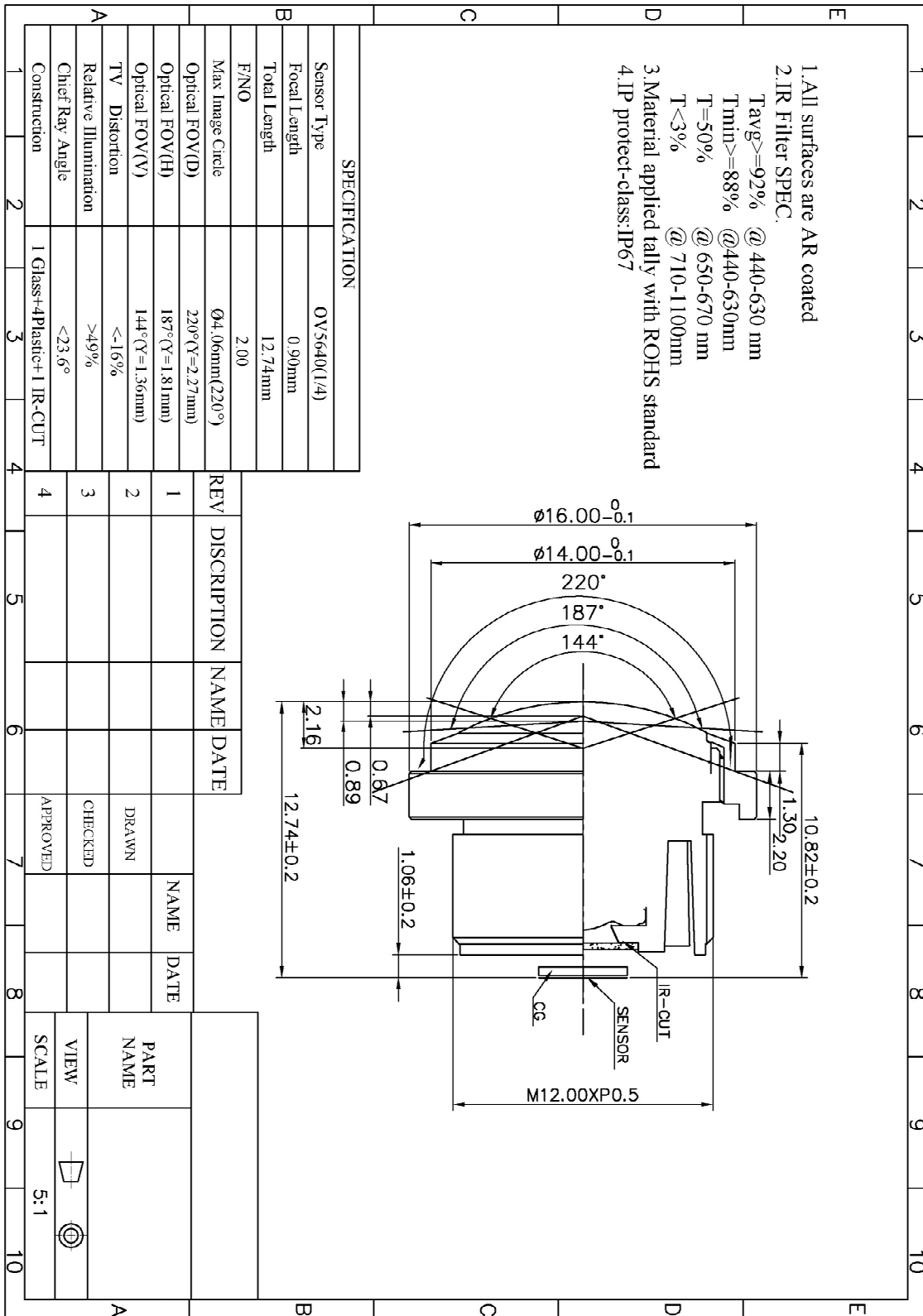
features

- 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 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)

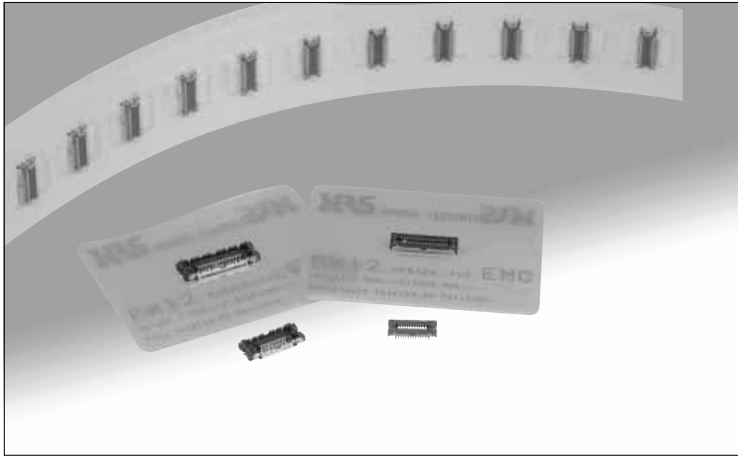
- active array size:** 2592 x 1944
- power supply:**
 - core: 1.425 ~ 1.675V (with embedded 1.5V regulator)
 - analog: 2.6 ~ 3.0V (2.8V typical)
 - I/O: 1.8V / 2.8V
- power requirements:**
 - active: 140 mA
 - standby: 20 μA
- temperature range:**
 - operating: -30°C to 70°C junction temperature (see [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_{ROW}
- pixel size:** 1.4 μm x 1.4 μm
- dark current:** 8 mV/s @ 60°C junction temperature
- image area:** 3673.6 μm x 2738.4 μm
- package dimensions:** 5985 μm x 5835 μm

YDS-LENS-TRC-F5022A6-02

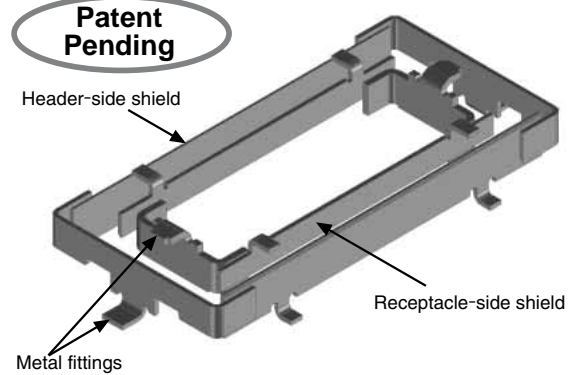


0.4 mm Pitch, 1.5 mm Board-to-Board Connectors with Dual Shields

FX12 Series



Dual Shields (when mated)



■ Features

1. Dual shields

Built-in shield plates and metal fittings in the plugs and receptacles prevent electromagnetic emission and external interference on the entire 360° periphery of mated connectors.

2. Low-Profile

Board-to-Board distance of 1.5 mm and reduced PCB mounting pattern allows use in applications where space is limited.

3. Self alignment

Built-in self-alignment feature in the plug and receptacle allows mating / un-mating in limited spaces.

4. Consistent mated retention force

Indents in the shield plates and contact configuration assure consistency of the mated retention forces irrespective of the contact numbers. Positive “click” sensation confirms fully mated condition.

5. Solder wicking prevention

Nickel plating barrier on the contacts prevents solder compound intrusion (wicking) into the contact engagement areas.

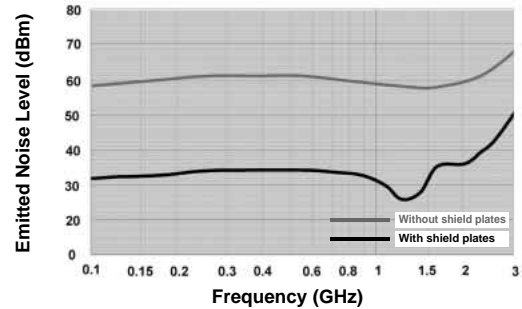
6. Board placement with automatic equipment

Packaged on tape-and-reel, the connectors have flat areas (0.8mm) to allow use of vacuum nozzles.

7. RoHS Compliant

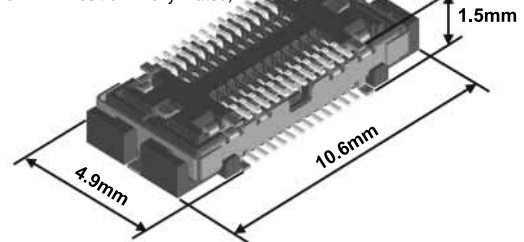
All components and materials comply with the requirements of the EU Directive 2002/95/EC.

High Shielding Effectiveness



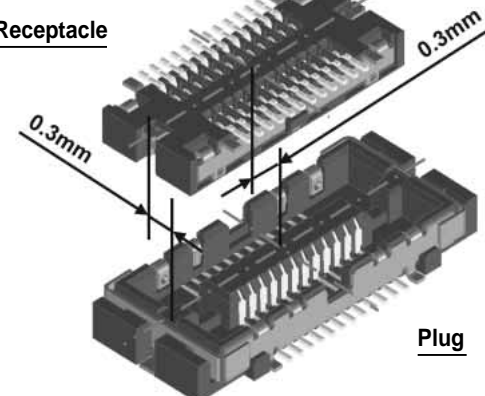
Low-Profile, Space-Saving with Reduced Connector Footprint

(Shown 24-Position – fully mated)



Self Alignment of 0.3 mm

Receptacle



FX12 Series 0.4 mm Pitch, 1.5 mm Board-to-Board Connectors with Dual Shields

■ Specifications

Rating	Current rating 0.3A Voltage rating 30V AC	Operating temperature range -55°C to +85°C (Note 1)	Storage temperature range -10°C to +60°C (Note 2) Storage humidity range Relative humidity 95% max. (No condensation)
--------	--	--	--

Item	Specification	Conditions
1. Insulation resistance	50 MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	100V AC/one minute
3. Contact resistance	100 mΩ max.	100 mA
4. Vibration	No electrical discontinuity of 1μs or more. No damage, cracks or parts dislocation.	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 3 axis, 10 cycles
5. Shock	No electrical discontinuity of 1μs or more. No damage, cracks or parts dislocation.	Acceleration of 490 m/s ² , 11 ms duration, sine half-wave waveform, 3 cycles / each of 3 axis
6. Humidity	Contact resistance: 120 mΩ max. Insulation resistance: 25 MΩ min. No damage, cracks or parts dislocation.	96 hours at 40°C, 90% to 95% R.H.
7. Temperature cycle	Contact resistance: 120 mΩ max. Insulation resistance: 50 MΩ min. No damage, cracks or parts dislocation.	Temperature: -55°C → +15°C to 35°C → +85°C → +15°C to +35°C Time: 30 → 2 to 3 → 30 → 2 to 3 (Minutes) 5 cycles
8. Durability (mating / un-mating)	Contact resistance: 120 mΩ max. No damage, cracks or parts dislocation.	30 cycles
9. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 360°C for 5 seconds

Note 1: Includes temperature rise caused by current flow.

Note 2: The term “storage” refers to products stored for long period of time prior to mounting and use. Operating temperature range and humidity range covers non-conducting condition of installed connectors in storage, shipment or during transportation.

Note 3: Information contained in this catalog represents general requirements for this Series. Contact us for the drawings and specifications for a specific part number shown.

■ Materials

Part	Material	Finish	Remarks
Insulator	Polyamide	Color: Black	UL94V-0
Contacts	Phosphor bronze	Plug	Selective gold plated
		Receptacle	
Ground plates		Gold plated	—
Metal fittings		Tin plated	—

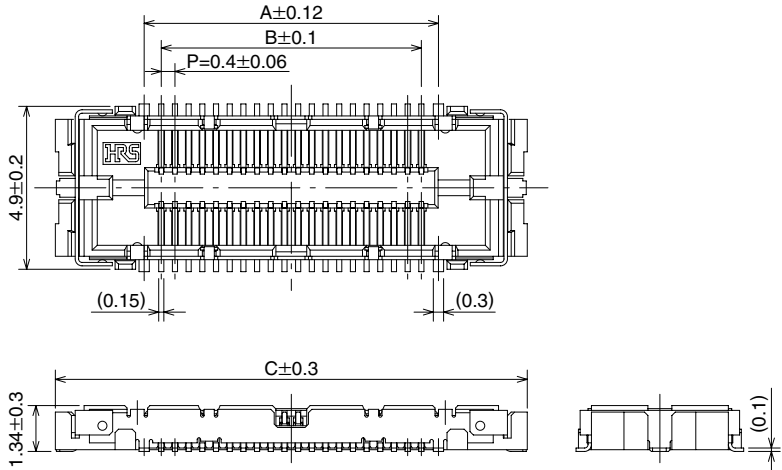
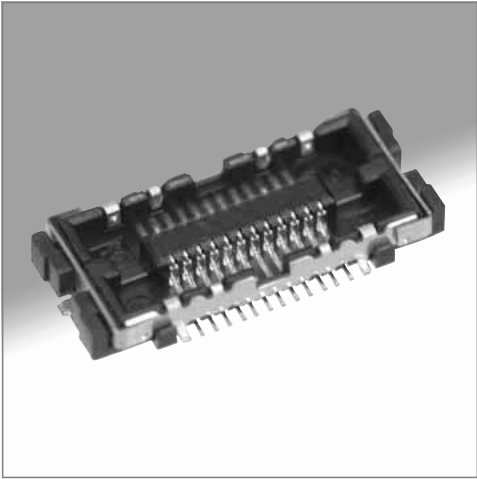
■ Ordering information

FX12 B - 24 P - 0.4 SV

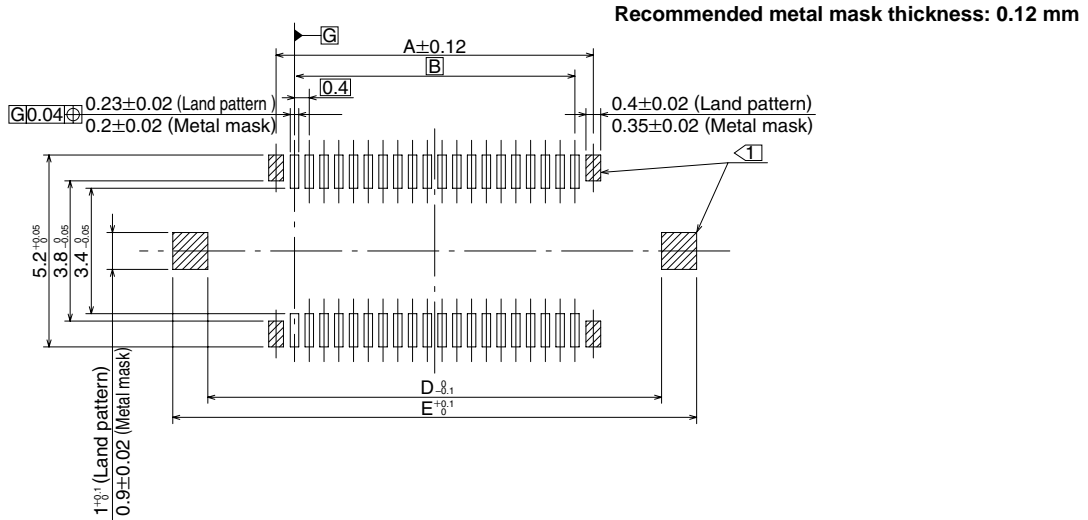
① ② ③ ④ ⑤ ⑥

① Series name: FX12	④ Connector type P: Plug S: Receptacle
② Configuration B: Without guide post	
③ Number of positions: 24, 40, 60	⑤ Contact pitch: 0.4 mm
	⑥ Termination configuration SV: SMT

Plugs



Recommended PCB Mounting Pattern and Metal Mask Dimensions



Notes:

- ① Positions marked indicate a ground circuit connections.
- 2 The co-planarity of SMT terminations is 0.1 maximum.
- 3 No polarity orientation for board mounting.
- 4 Dimensions in parentheses () are reference dimensions.
- 5 All dimensions in mm.

Part number	CL No.	Number of positions	A	B	C	D	E	RoHS
FX12B-24P-0.4SV	573-1005-0	24	5.4	4.4	10.6	9.1	11.0	YES
FX12B-40P-0.4SV	573-1001-0	40	8.6	7.6	13.8	12.3	14.2	
FX12B-60P-0.4SV	573-1007-6	60	12.6	11.6	17.79	16.3	18.2	

Packaging : 3,000 pieces per reel



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							
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

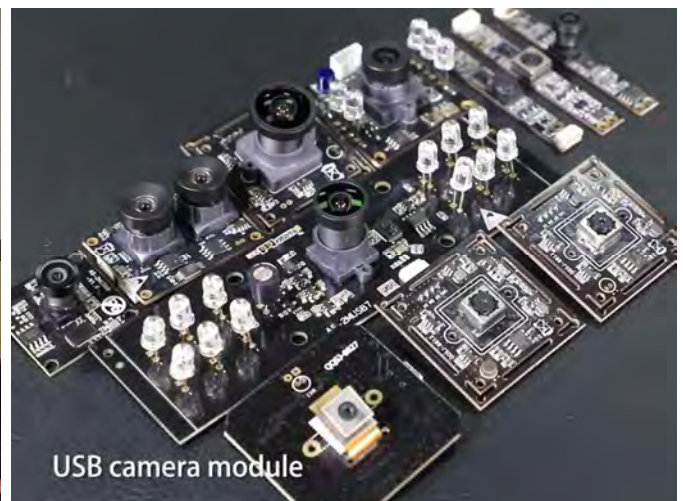
your best camera partner

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 CAMERA MODULE

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YDS Strength

Powerful Factory



Professional Service



Promised Delivery



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