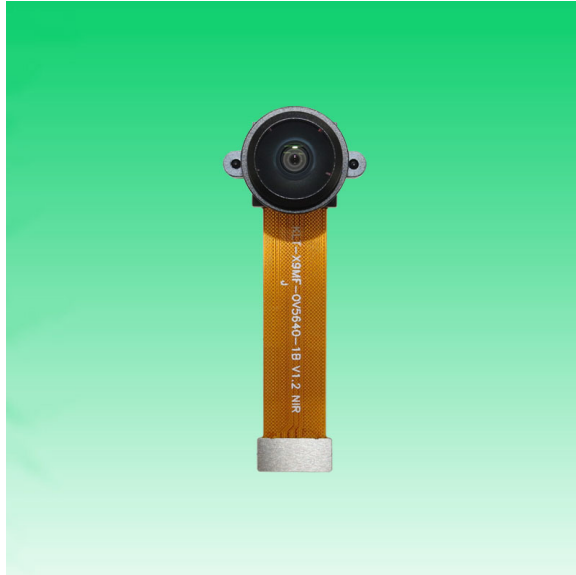




KLT-X9MF-OV5640-1B V1.2 NIR
5MP OmniVision OV5640-1B MIPI and DVP Parallel Interface
No IR M12 Fixed Focus Camera Module



Front View



Back View

Specifications

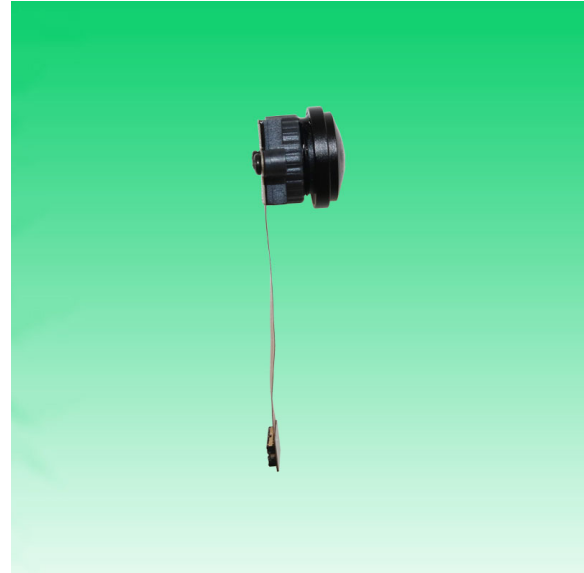
Camera Module No.	KLT-X9MF-OV5640-1B V1.2 NIR
Resolution	5MP
Image Sensor	OV5640-1B
Sensor Type	1/4"
Pixel Size	1.4 um x 1.4 um
EFL	0.90 mm
F.NO	2.00
Pixel	2592 x 1944
View Angle	220.0°(DFOV) 187.0°(HFOV) 144.0°(VFOV)
Lens Dimensions	13.00 x 13.00 x 13.56 mm
Module Size	55.00 x 22.00 mm
Module Type	Fixed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



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



Top View



Side View



Bottom View



Mating Connector

A

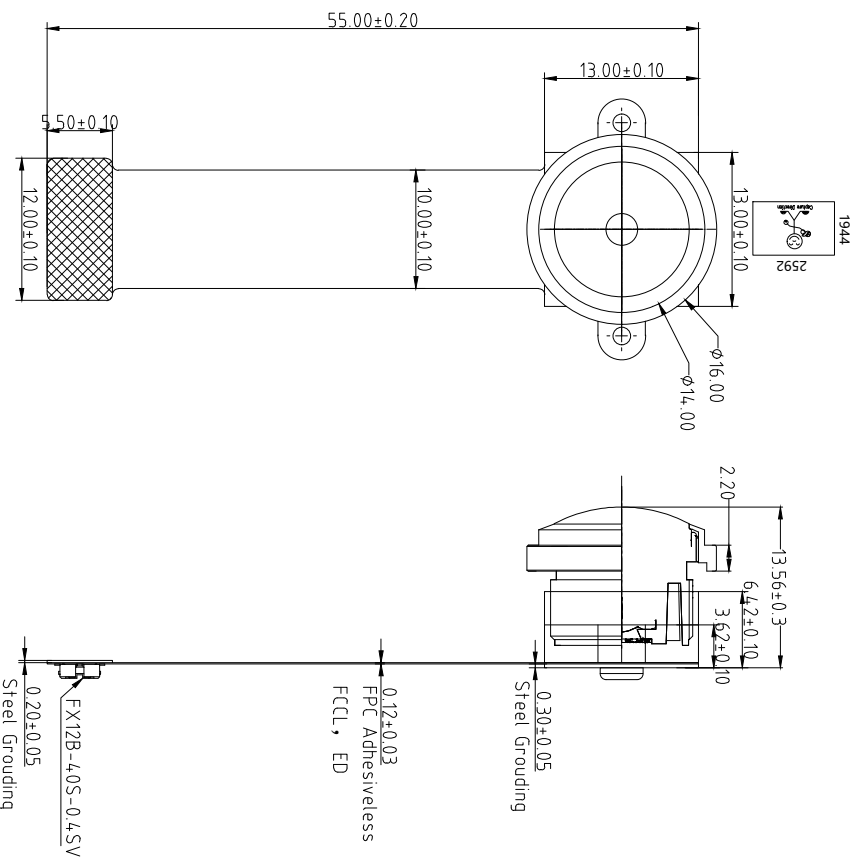
B

C

D

E

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: 1.4um×1.4um

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)

Kai Lap Technologies Group Ltd

Designed By

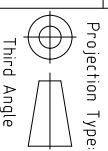
Kevin

Model Name:

KLT-X9MF-0V5640-1B V1.2 NIR

Checked By

Aouly_Yan



Unit: mm

Scale: 1:1

Material: -----

Sheet: 1 of 1

Version: 1/0

A

B

C

D

E

Version

V1.2

Information

First Version

Date

7-12-2022

A

B

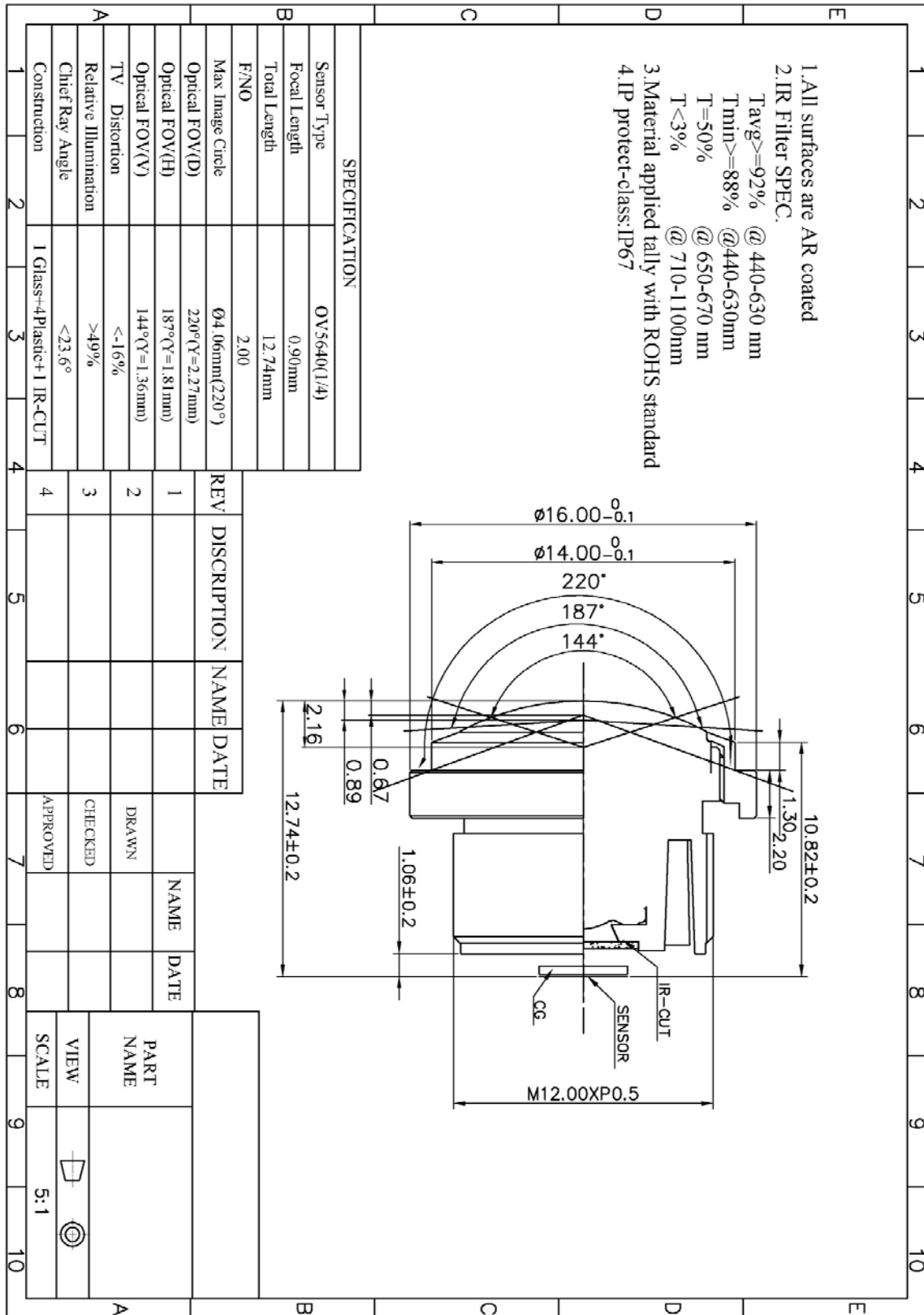
C

D

E

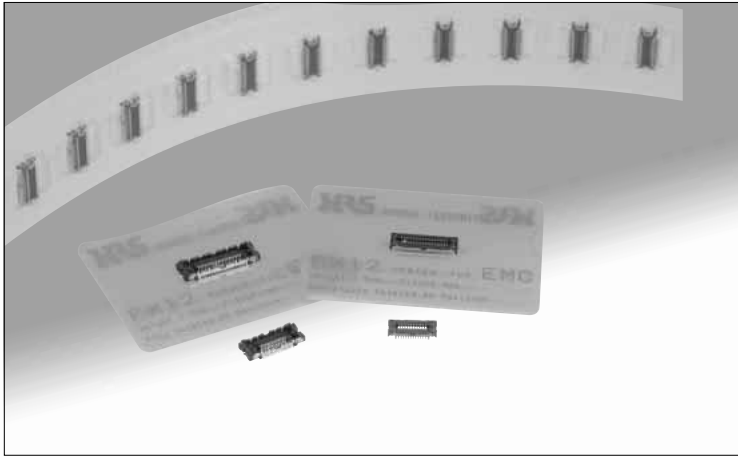


Lens Model: KLT-LENS-TRC-F5022A6-02

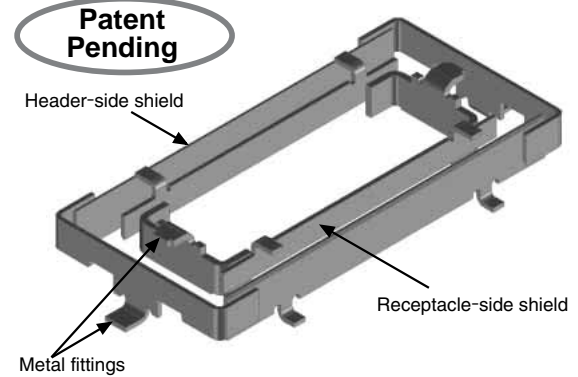


0.4 mm Pitch, 1.5 mm Board-to-Board Connectors with Dual Shields

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.

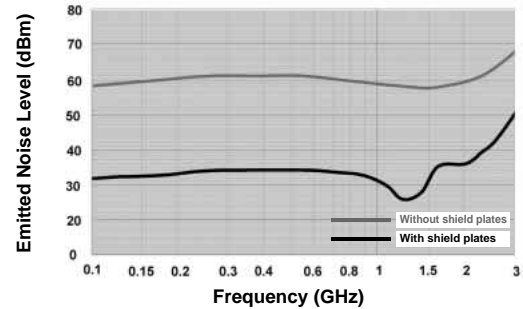
6. Board placement with automatic equipment

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

7. RoHS Compliant

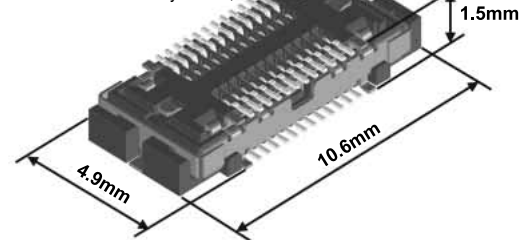
All components and materials comply with the requirements of the EU Directive 2002/95/EC.

High Shielding Effectiveness

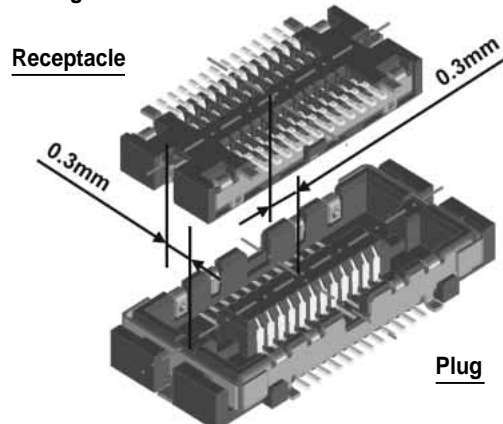


Low-Profile, Space-Saving with Reduced Connector Footprint

(Shown 24-Position – fully mated)



Self Alignment of 0.3 mm



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	—

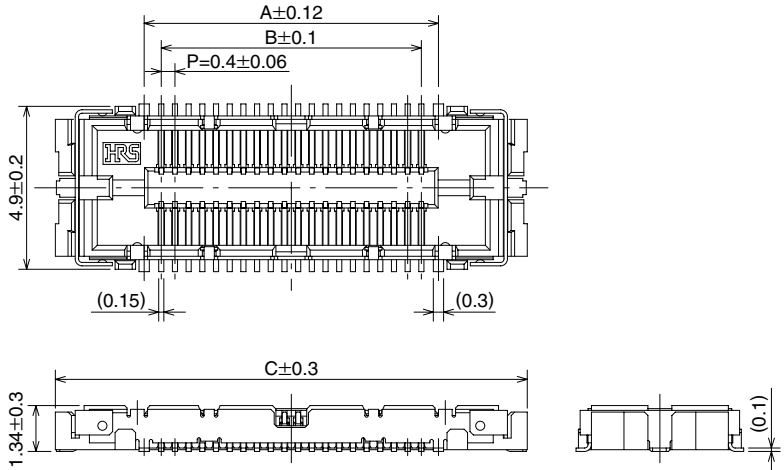
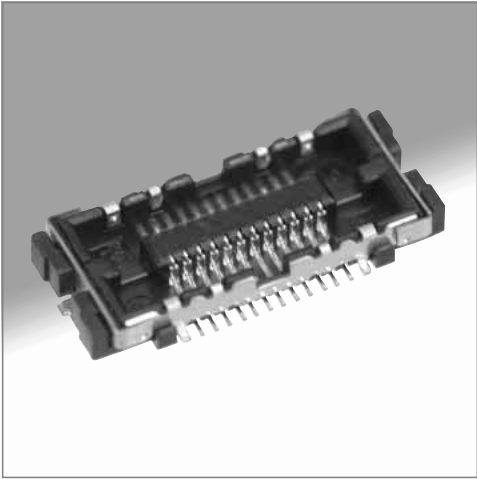
Ordering information

FX12 B - 24 P - 0.4 SV

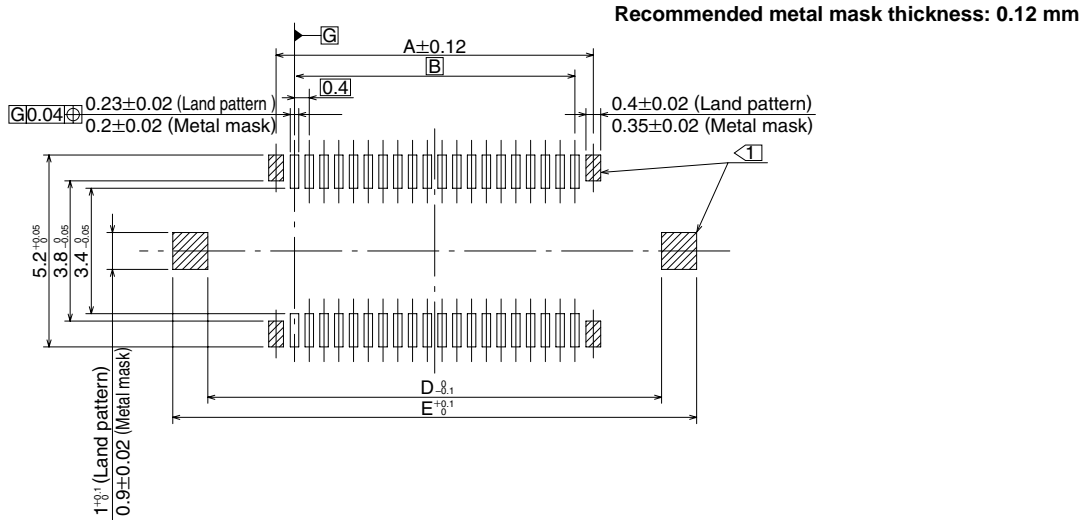
① ② ③ ④ ⑤ ⑥

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

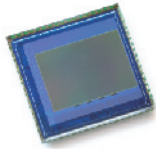


Notes:

- 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



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



Camera Module Pinout Definition Reference Chart

OmniVision	Sony	Samsung	On-Semi	Aptina	Himax	GalaxyCore	PixArt	SmartSens	Sensors
Pin Signal									
Description									
DGND	GND								
AGND									
PCLK	DCK								
XCLR	PWDN	XSHUTDOWN	STANDBY						
MCLK	XVCLK	XCLK	INCK						
RESET	RST								
NC	NULL								
SDA	SIO_D	SIOD							
SCL	SIO_C	SIOC							
VSYNC	XVS	FSYNC							
HREF	XHS								
DOVDD									
AFVDD									
AVDD									
DVDD									
STROBE	FSTROBE								
FSIN									
SID									
ILPWM									
FREX									
GPIO									
SLASEL									
AFEN									
MIPI Interface									
MDN0	DN0	MD0N	DATA_N	DMO1N					
MDP0	DP0	MD0P	DATA_P	DMO1P					
MDN1	DN1	MD1N	DATA2_N	DMO2N					
MDP1	DP1	MD1P	DATA2_P	DMO2P					
MDN2	DN2	MD2N	DATA3_N	DMO3N					
MDP2	DP2	MD2P	DATA3_P	DMO3P					
MDN3	DN3	MD3N	DATA4_N	DMO4N					
MDP3	DP3	MD3P	DATA4_P	DMO4P					
MCN	CLKN	CLK_N	DCKN						
MCP	CLKP	MCP	CLK_P	DCKN					
DVP Parallel Interface									
D0	DO0	Y0							
D1	DO1	Y1							
D2	DO2	Y2							
D3	DO3	Y3							
D4	DO4	Y4							
D5	DO5	Y5							
D6	DO6	Y6							
D7	DO7	Y7							
D8	DO8	Y8							
D9	DO9	Y9							
D10	DO10	Y10							
D11	DO11	Y11							



your BEST camera module partner

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



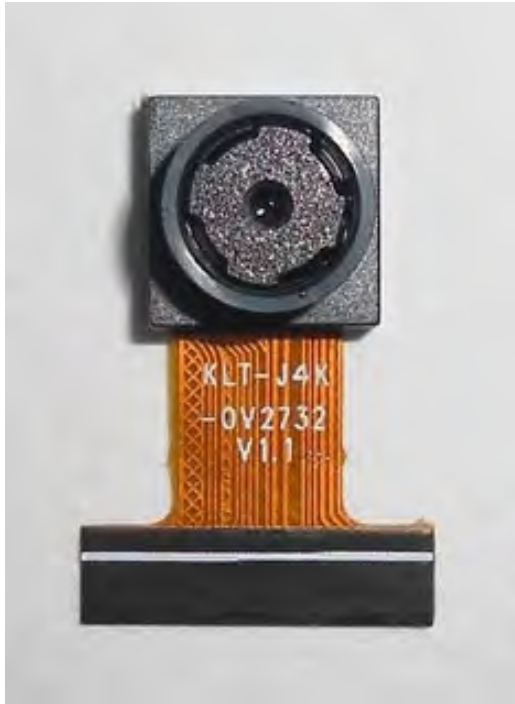


Inspection Item		Inspection Method	Standard of Inspection		
Category	Item				
Appearance	FPC/ PCB	Color	The Naked Eye	Major Difference is Not Allowed.	
		Be Torn/Chopped	The Naked Eye	Copper Crack Exposure is Not Allowed.	
		Marking	The Naked Eye	Clear, Recognizable (Within 30cm Distance)	
	Holder	Scratches	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		



KLT Package Solutions

KLT Camera Module



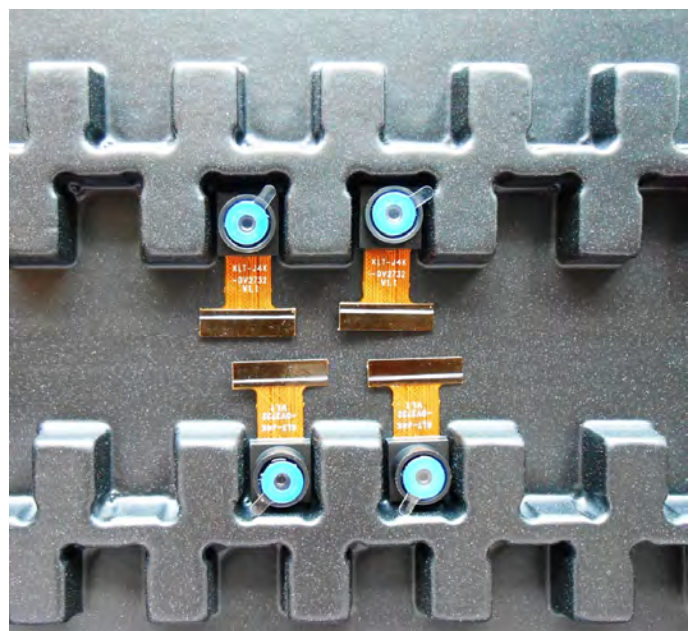
Complete with Lens Protection Film



Tray with Grid and Space



Place Cameras on the Tray





Camera Modules Package Solution

Full Tray of Cameras



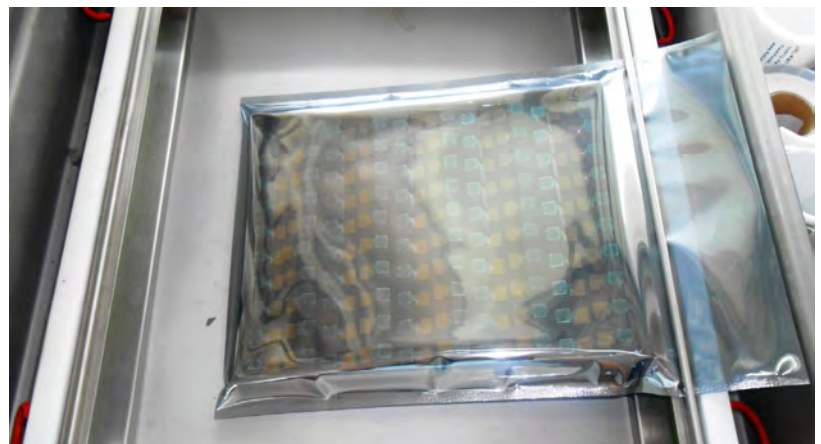
Cover Tray with Lid



Put Tray into Anti-Static Bag



Vacuum the Anti-Static Bag





Camera Modules Package Solution

Sealed Vacuum Bag with Labels

1. Model and Description 2. Quantity 3. Shipping Date 4. Caution





Large Order Package Solution

Place Foam Sheets Between Trays



Foam Sheets are Slightly Larger than Trays



Place Foam Sheets and Trays into Box



Foam Sheets are Tightly Fitting Box





Small Order Package Solution

Place Foam Sheets and Trays into Small Box



Foam Sheets are Nicely Fitting the Small Box



Package in Small Box for Shipment



Place Small Boxes into Larger Box





CMOS CAMERA MODULES



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Carbon Box Package Solution

Seal the Carbon Box

Final Package Labelled Box



Carbon Box Ready for Shipment

1. Delivery Address and Phone No. 2. Box No. and Ship Date 3. Fragile Caution



www.KaiLapTech.com sales@KaiLapTech.com Tel: (852) 6908 1256 Fax: (852) 3017 6778

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Sample Order Package Solution

Place Sample into Small Anti-Static Bag



Place Connectors into Small Ant-Static Bag



Sample Labels on the Small Bag

1. Camera Module or Connector Model
2. Shipping Date and Quantity
3. Caution





Connectors Large Order Package Solution

Connectors in a Wheel



Label Connectors in the Wheel



The Wheel is Perfectly Fitting the Box



Connectors Box Ready for Shipment



Company Kai Lap Technologies (KLT)

Kai Lap Technologies Group Limited. (KLT) was established in 2009, a next-generation technology driven manufacturer specialized in research, design, and produce of audio and video products. KLT is occupying 20,000 square feet automated plants with 100 employees of annual throughput 30,000,000 units cameras.

KLT 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. KLT 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

KLT provides the following limited warranty if you purchased the Product(s) directly from KLT company or from KLT's website, www.KaiLapTech.com. Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. KLT 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, KLT 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 KLT is solely limited to repair and/or replacement on the terms set forth above. KLT is not reliable or responsible for any subsequent events.





CMOS CAMERA MODULES



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KLT Strength

Powerful Factory



Professional Service



Promised Delivery



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