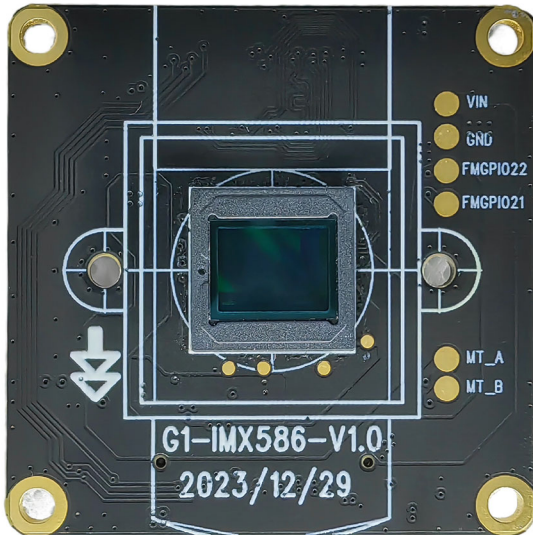


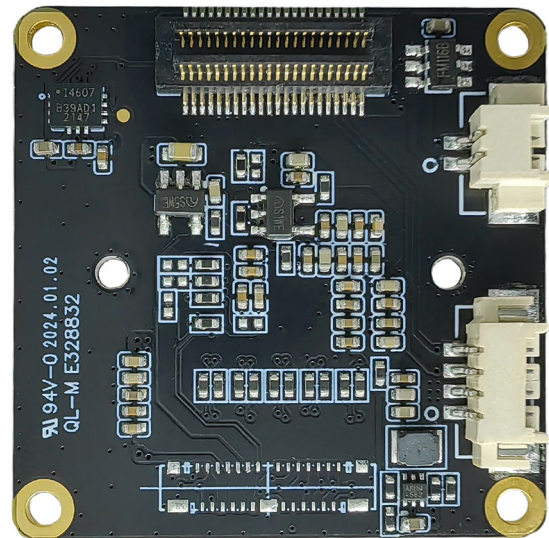


## KLT-CMNL-IMX586 V1.0

### 48MP Sony IMX586 No Lens Camera Module



Front View



Back View

### Overview

KLT-CMNL-IMX586 V1.0 is a no lens camera module sensor board, with a diagonal of 8.0mm (1/2.0 type) CMOS Sony IMX586 image sensor, a pixel of 0.80 $\mu$ m, a color square pixel display, an effective pixel of 48 megapixels, and a high-definition image.

When used with the master board, it can support 48MP pixel high-definition photography, and can support up to 4K@60FPS (differential), 4K@30FPS video shooting.

Use board-to-board socket connection. Support multi-axis EIS anti-shake image stabilization function. The board frame size is 32x32mm.



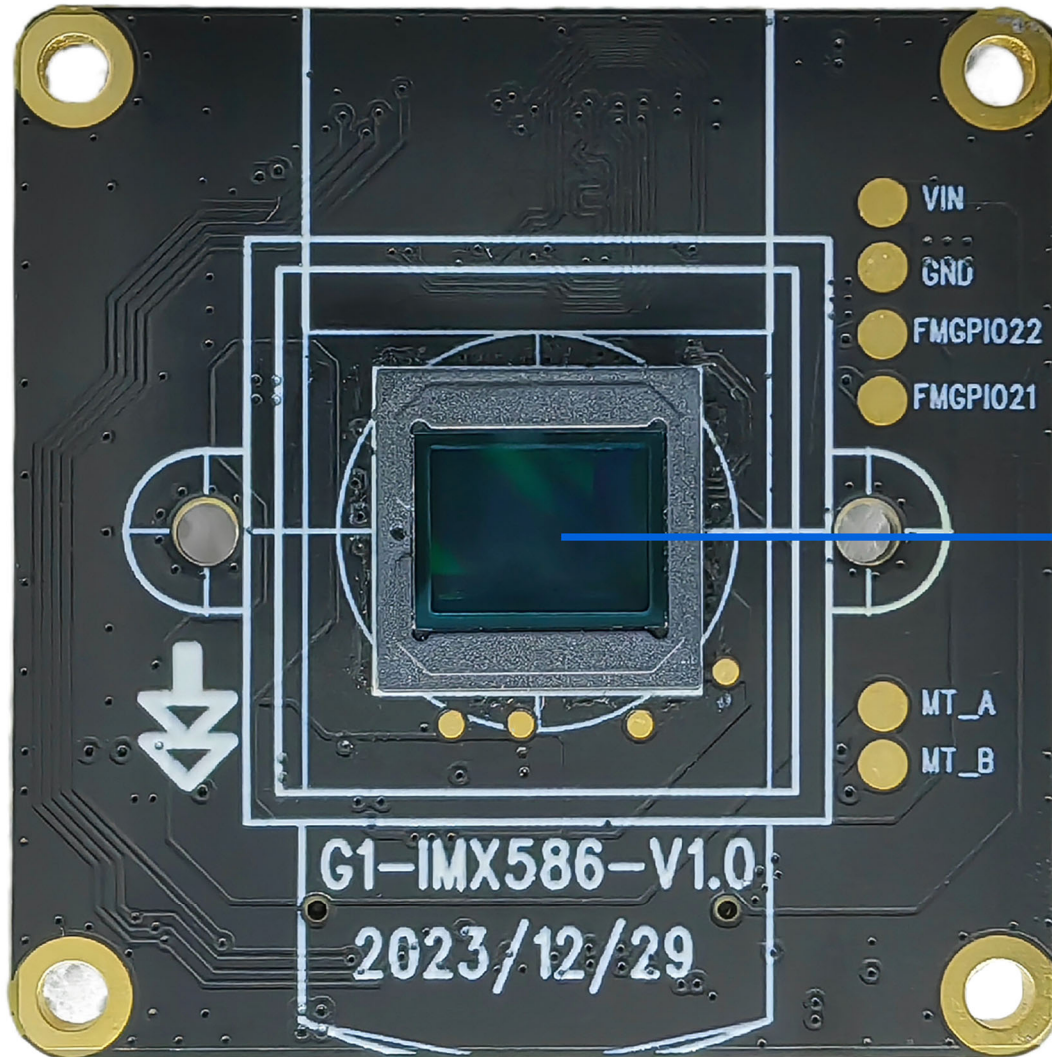
## KLT-CMNL-IMX586 V1.0 48MP Sony IMX586 No Lens Camera Module

### Specifications

<b>Model No.</b>	<b>KLT-CMNL-IMX586 V1.0</b>
<b>Image Sensor</b>	IMX586
<b>Image Sensor Type</b>	CMOS
<b>Effective Pixels</b>	48 Megapixels
<b>Sensor Size</b>	1/2.0"
<b>Pixel Size</b>	0.8um x 0.8um
<b>EIS Anti-Shake (Reserved)</b>	Supportive Electronic EIS Image Stabilization
<b>Video Frame Rate</b>	4K@24/25/30/FPS 2.7K@24/25/30/48/50/60FPS 1080P@24/25/30/48/50/60/120FPS 720P@24/25/30/48/50/60/120/240FPS
<b>Photo Resolution (with Master Board)</b>	48MP (8000x6000) 14MP (4592x3056) 12MP (4000x3000) 10MP (3648x2736) 8MP (3264x2448) 5MP (2592x1944) 3MP (2048x1536) 2MP (1920x1080)
<b>Operating Temperature</b>	-10°C to +60°C
<b>Storage Temperature</b>	-20°C to +80°C
<b>Humidity</b>	20% to 80%
<b>PCB Dimensions</b>	32 x 32 mm
<b>Module Size</b>	32 x 32 x 28 mm
<b>PCB Screw Hole Spacing</b>	28 x 28 mm
<b>PCB Screw Hole Diameter</b>	2 mm
<b>Lens Mount Screw Diameter</b>	1.6 mm



## KLT-CMNL-IMX586 V1.0 48MP Sony IMX586 No Lens Camera Module

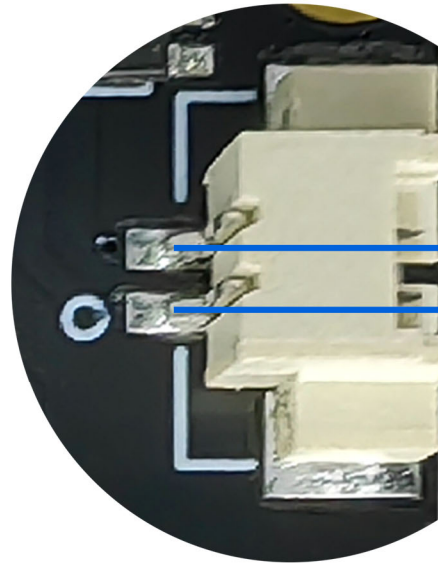
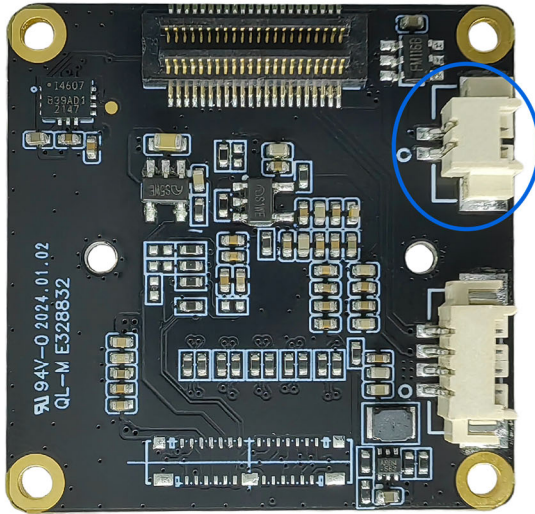


**Sony IMX586 sensor**



## KLT-CMNL-IMX586 V1.0

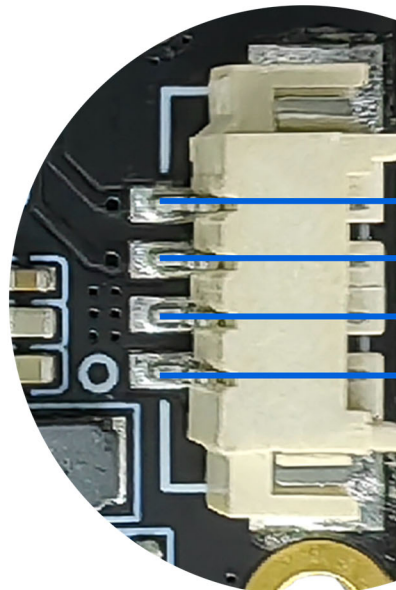
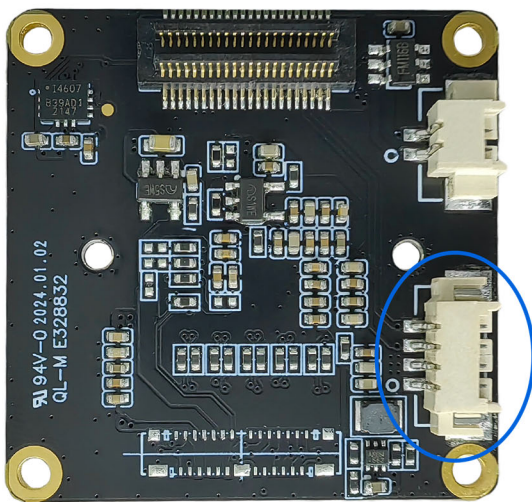
### 48MP Sony IMX586 No Lens Camera Module



MOTO\_B

MOTO\_A

The IR-Cut filter switch interface is used by lenses with filters. Users need to match the lens that supports the IR-Cut switch structure in order to support this function.



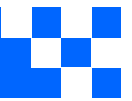
FMGPIO21

FMGPIO22

GND

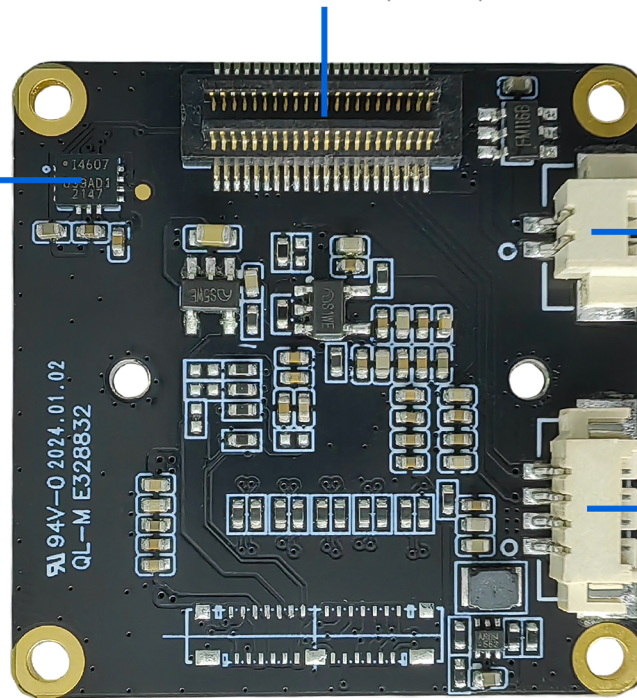
VIN

Customize the I/O port expansion interface. To implement this function, you need to customize the software function and load the software into the master board.

**KLT-CMNL-IMX586 V1.0****48MP Sony IMX586 No Lens Camera Module****通过板对板连接器连接G5 (V57M) 主板  
支持Sensor、EIS、IR-CUT等**

Connect Sensor, EIS, IR-CUT etc.

陀螺仪,  
支持EIS防抖  
EIS Stabilization



滤光片  
切换器接口  
IR-CUT INTERFACE

扩展IO接口  
Extended IO interface

Diagonal 8.000 mm (Type 1/2.0) 48Mega-Pixel CMOS Image Sensor with Square Pixel for Color Cameras

## IMX586-AAJH5-C

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### General description and application

IMX586 is a diagonal 8.000 mm (Type 1/2.0) 48 Mega-pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Sony's back-illuminated and stacked CMOS image sensor to achieve high speed image capturing by column parallel A/D converter circuits and high sensitivity and low noise image (comparing with conventional CMOS image sensor) through the backside illuminated imaging pixel structure. R, G, and B pigment primary color mosaic filter is employed. It operates with five power supply voltages: analog 2.9 V and 1.8V, digital 1.1 V, PLL-PHY 1.1V and 1.8 V for input/output interface and achieves low power consumption.

In addition, this product is designed for use in cellular phone and tablet PC. When using this for another application, Sony Semiconductor Solutions Corporation does not guarantee the quality and reliability of product. Therefore, don't use this for applications other than cellular phone and tablet PC. Consult your Sony Semiconductor Solutions Corporation sales representative if you have any questions.

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### Functions and Features

- ◆ Back-illuminated and stacked CMOS image sensor
- ◆ Quad Bayer Coding color filter arrangement
- ◆ Phase Detection Auto Focus (PDAF)
- ◆ High Frame Rate 30fps@Full resolution (QBC Re-mosaic) / 30fps@QBC-HDR / 120fps@2x2 Adjacent Pixel Binning (16:9) / 240fps@2x2 Adjacent Pixel Binning V2H2(16:9)
- ◆ High signal to noise ratio(SNR)
- ◆ Dual sensor synchronization operation
- ◆ Built-in 2D Dynamic Defect Pixel Correction
- ◆ Lens Shading Correction (LSC)
- ◆ Built-in temperature sensor
- ◆ Output video format of RAW10/8, COMP8
- ◆ QBC Re-mosaic function
- ◆ QBC HDR function
- ◆ Two PLLs for independent clock generation for pixel control and data output interface
- ◆ CSI-2 serial data output
  - MIPI D-PHY 2lane/4lane, Max. 2.5Gbps/lane, D-PHY spec. ver. 1.2 compliant
  - MIPI C-PHY 1/2/3trio, Max 2.5Gbps/Trio, C-PHY spec ver. 1.0 compliant
- ◆ 2-wire serial communication (Supports I<sup>2</sup>C "Fast mode" and "Fast-mode Plus")
- ◆ 28K bit of OTP ROM for users

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Application circuits shown, if any, are typical examples illustrating the operation of the devices. Sony Semiconductor Solutions Corporation cannot assume responsibility for any problems arising out of the use of these circuits.

## Device Structure

◆ CMOS image sensor	
◆ Image size	: Diagonal 8.000 mm (Type 1/2.0)
◆ Total number of pixels	: 8032 (H) × 6248 (V) approx. 50.18 M pixels
◆ Number of effective pixels	: 8032 (H) × 6088 (V) approx. 48.89 M pixels
◆ Number of active pixels	: 8000 (H) × 6000 (V) approx. 48.00 M pixels
◆ Chip size	: 7.504 mm (H) × 5.659 mm (V)
◆ Unit cell size	: 0.80 μm (H) × 0.80 μm (V)
◆ Substrate material	: Silicon

## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	notes
Supply voltage (analog1)	VANA1	-0.3 to +4.2	V	refer to VSS level
Supply voltage (analog2)	VANA2	-0.3 to +2.52	V	
Supply voltage (digital1, digital2(PLL-PHY))	VDIG1,2	-0.3 to +1.54	V	
Supply voltage (interface)	VIF	-0.3 to +2.52	V	
Input voltage (digital)	VI	-0.3 to +2.52	V	
Output voltage (digital)	VO	-0.3 to +2.52	V	
Guaranteed Operating temperature	TOPR	-20 to +70	°C	
Guaranteed storage temperature	TSTG	-30 to +80	°C	
Guaranteed performance temperature	TSPEC	-20 to +60	°C	

## Recommended Operating Voltage

Item	Symbol	Ratings	Unit	notes
Supply voltage (analog1)	VANA1	2.9 ± 0.1	V	refer to VSS level
Supply voltage (analog2)	VANA2	1.8 ± 0.1	V	
Supply voltage (digital1, digital2(PLL-PHY))	VDIG1,2	1.1 ± 0.1	V	
Supply voltage (interface)	VIF	1.8 ± 0.1	V	



## Cameras Applications



Automotive Driver Pilot



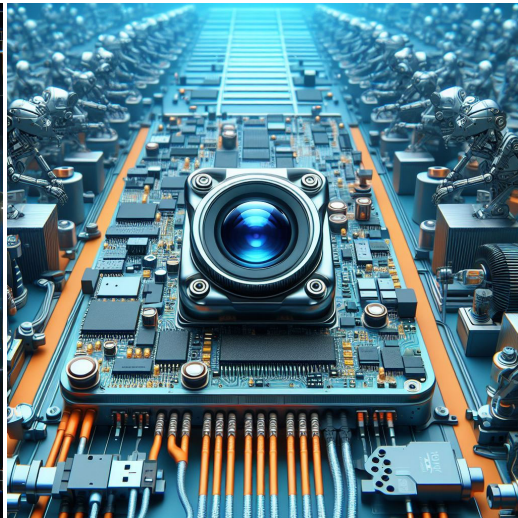
Live Streaming



Video Conference



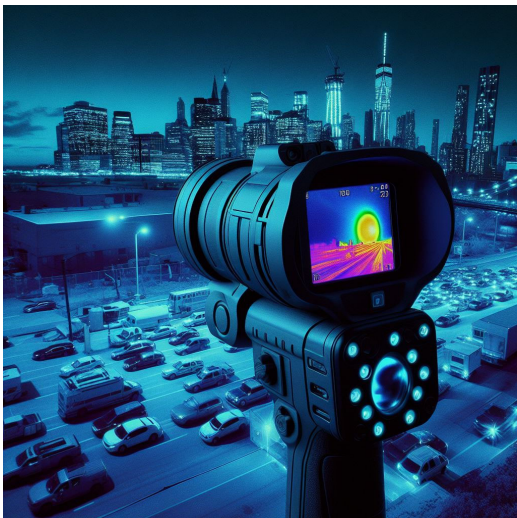
Eye Tracker Biometric Detection



Machine Vision



Agricultural Monitor



Night Vision Security



Drone and Sports Eagle Eyes



Interactive Pet Camera





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## Cameras Applications





## Camera Module Pinout Definition Reference Chart

OmniVision	Sony	Samsung	On-Semi	Aptina	Himax	GalaxyCore	PixArt	SmartSens	Sensors
<b>Pin Signal</b>									
<b>Description</b>									
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									
<b>MIPI Interface</b>									
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					
<b>DVP Parallel Interface</b>									
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							



## 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



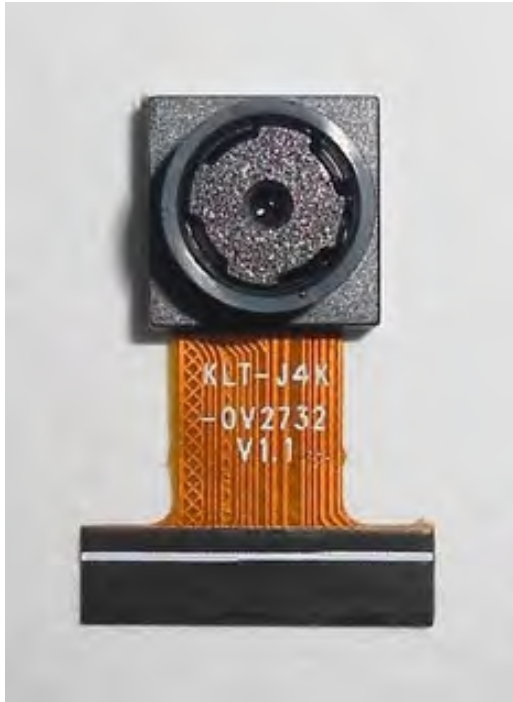


Inspection Item		Inspection Method	Standard of Inspection		
Category	Item				
Appearance	FPC/ PCB	Color	The Naked Eye	Major Difference is Not Allowed.	
		Be Torn/Chopped	The Naked Eye	Copper Crack Exposure is Not Allowed.	
		Marking	The Naked Eye	Clear, Recognizable (Within 30cm Distance)	
	Holder	Scratches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



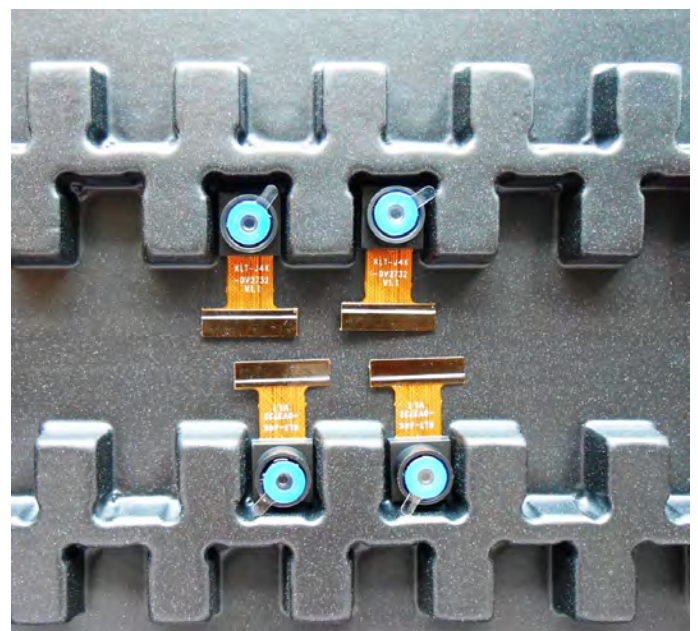
Complete with Lens Protection Film



Tray with Grid and Space



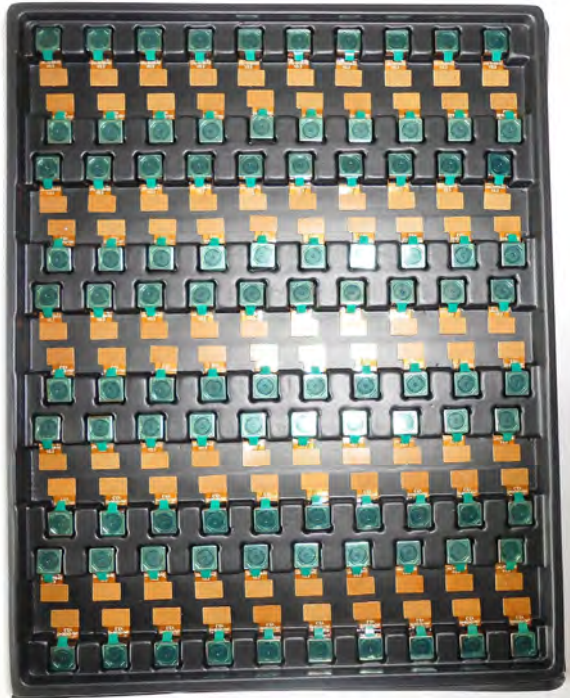
Place Cameras on the Tray





## Camera Modules Package Solution

Full Tray of Cameras



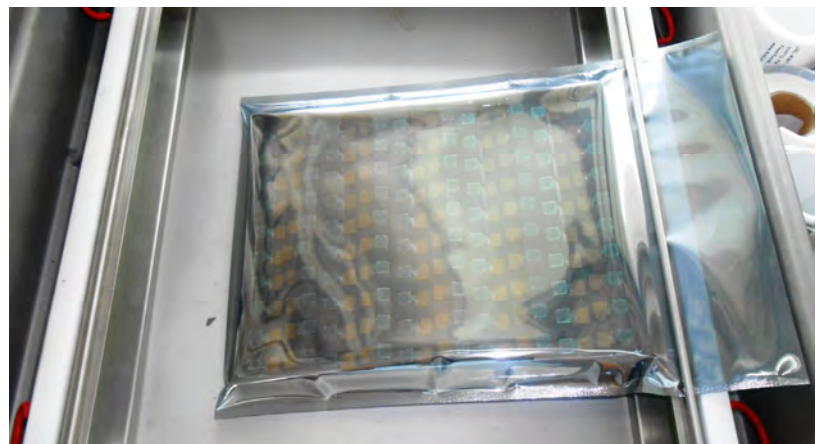
Cover Tray with Lid



Put Tray into Anti-Static Bag



Vacuum the Anti-Static Bag



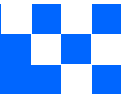


## Camera Modules Package Solution

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





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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





## Sample Order Package Solution

Place Sample into Small Anti-Static Bag



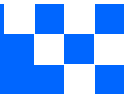
Place Connectors into Small Ant-Static Bag



### 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

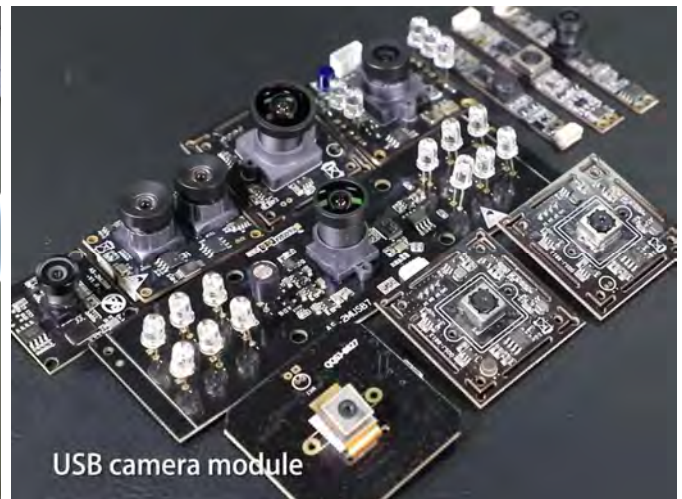


## Company Kai Lap Technologies (KLT)

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](http://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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