

**KLT-C6MF-OV4689-2A V3.0****4MP OmniVision OV4689-2A MIPI Interface M12 Fixed Focus Camera Module**

Front View



Back View

Specifications

Camera Module No.	KLT-C6MF-OV4689-2A V3.0
Resolution	4MP
Image Sensor	OV4689-2A
Sensor Type	1/3"
Pixel Size	2.0 um x 2.0 um
EFL	3.00 mm
F.NO	2.00
Pixel	2688 x 1520
View Angle	130.0°(DFOV) 104.0°(HFOV) 54.6°(VFOV)
Lens Dimensions	13.70 x 13.70 x 18.00 mm
Module Size	40.05 x 22.00 mm
Module Type	Fixed Focus
Interface	MIPI
Auto Focus VCM Driver IC	None
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +85°C
Mating Connector	DF30FC-40DS-0.4V



KLT-C6MF-OV4689-2A V3.0

4MP OmniVision OV4689-2A MIPI Interface M12 Fixed Focus Camera Module



Top View



Side View

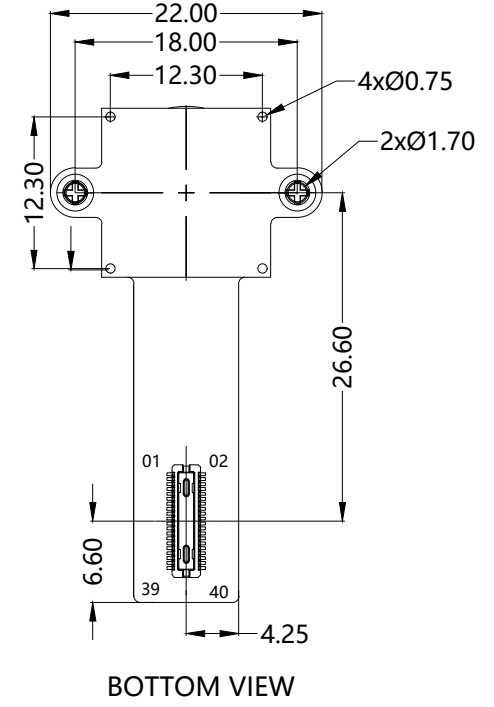
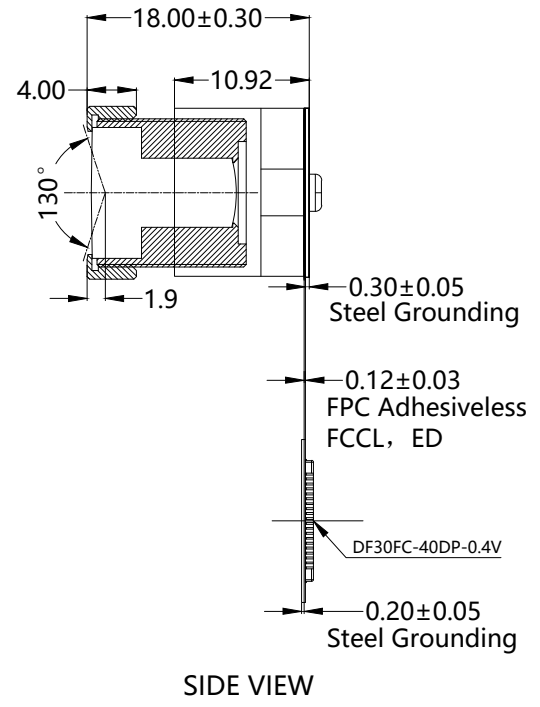
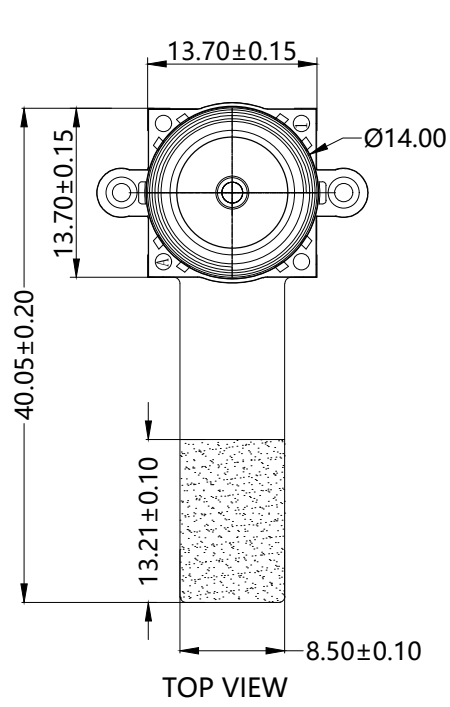


Bottom View



Mating Connector

1	AGND
2	NC
3	STROBE
4	NC
5	SIOD
6	GPIO
7	SIOC
8	AVDD(2.6~3.0V)
9	XSHUTDN
10	MDP2
11	NC
12	MDN2
13	VSYNC
14	DGND
15	HREF
16	MDP1
17	PWDNB
18	MDN1
19	NC
20	DGND
21	NC
22	MCP
23	NC
24	MCN
25	NC
26	DGND
27	NC
28	MDP0
29	IL_PWM
30	MDN0
31	FREX
32	DGND
33	FSIN
34	MCLK
35	MDP3
36	DVDD(1.1~1.3V)
37	MDN3
38	DOVDD(1.7~3.0V)
39	DGND
40	DGND



Version	Information	Date
V1.0	First Version	5-4-2018
V2.0	Change lens and holder	8-17-2020
V3.0	Change chip and holder	12-15-2022

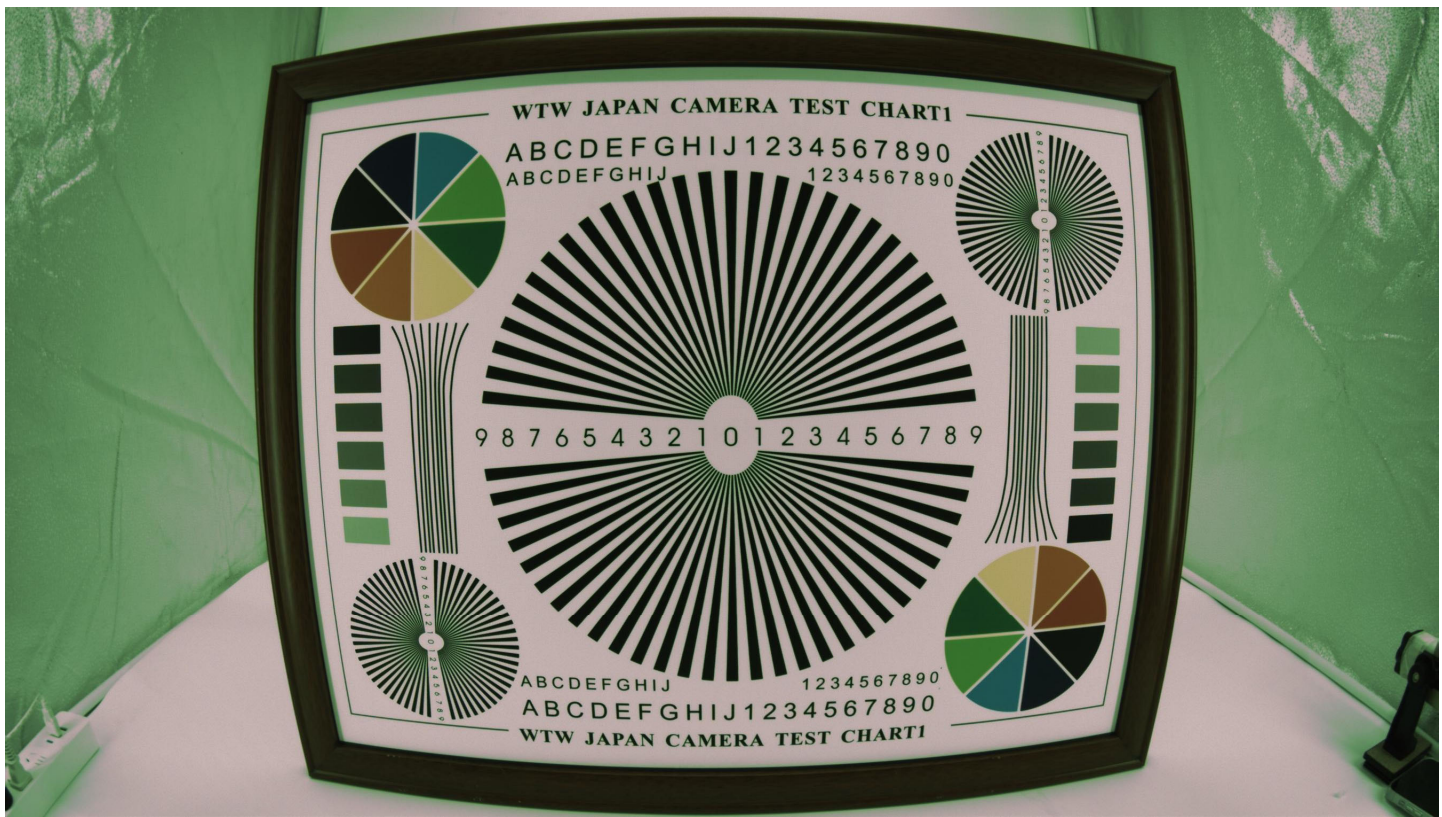
NOTE:
1.The device slave address:0x6c(write);0x6d(r);

Parameter: 1、Sensor specification: Image Sensor: OV04689-H67A-2A Pixel: 2.0um*2.0um Lens Type: 1/3 Important Voltage Description: DVDD1.2V (external power supply);	2、Lens specification: FOV: 130°(D);104°(H);54.6°(V) F/NO.: 2.0 TV distortion: <35% Focal length: 3.0mm Composition: 5E+IR FILTER IR Cut Coating: 650nm±10nm@50%
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Kai Lap Technologies Group Ltd			
Designed By	Kevin	Model Name:	KLT-C6MF-OV4689-2A V3.0
Checked By	Aouly_Yan	Projection Type:	Unit: mm
		Scale: 1:1	Material: -----
		Sheet: 1 of 1	Version: 1/0

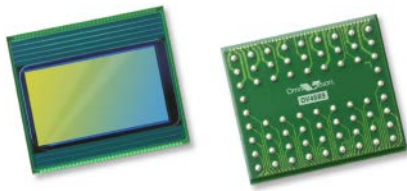
Real Test Images

C6MF-OV4689-2A V3.0



Real Test Images
C6MF-OV4689-2A V3.0





OV4689 4MP product brief



High Frame Rate 4-Megapixel CameraChip™ Sensor with Excellent Low-Light Sensitivity and High Dynamic Range for Security Applications



available in a lead-free package

The OV4689 is a high performance 4-megapixel CameraChip sensor in a native 16:9 format designed for next-generation surveillance and security systems. The sensor utilizes an advanced 2-micron OmniBSI™-2 pixel to provide best-in-class low-light sensitivity and high dynamic range (HDR).

The 1/3-inch OV4689 can capture full-resolution 4-megapixel high definition (HD) video at 90 frames per second (fps), 1080p HD at 120 fps, and binned 720p HD at 180 fps. The sensor's high frame rates enable crisp, clean image and video capture of fast moving objects.

The OV4689 provides timing to capture full-resolution HDR using frame-based "sequential HDR" or line-based "staggered HDR", and quarter resolution HDR using

"alternate row HDR". The benefits of using "staggered HDR" compared to "sequential HDR" are significant reduction in motion artifacts and lower memory requirement for host processing. These modes produce high quality full-resolution 4-megapixel HDR video under extreme variations of bright and dark conditions, ensuring high contrast and excellent scene reproduction.

The OV4689 features a high-speed 4-lane MIPI serial output interface to facilitate the required high data transfer rate. The OV4689 is available in a chip scale package (CSP).

Find out more at www.ovt.com.



OmniVision

applications

- IP cameras
- sports cameras
- automotive

ordering information

- **OV04689-H67A-2A** (color, lead-free)
67-pin CSP5

features

- automatic black level calibration (ABLC)
- programmable controls for frame rate, mirror and flip, cropping, and windowing
- static defective pixel canceling
- supports output formats: 10-bit RAW RGB (MIPI)
- supports horizontal and vertical subsampling
- supports images sizes: 4Mpixel, 3Mpixel, EIS1080p, 1080p, EIS720p
- fast mode switching
- support 2x2 binning, 4x4 binning, re-sampling filter
- standard serial SCCB interface
- up to 4-lane MIPI serial output interface
- embedded 4K bits one-time programmable (OTP) memory for part identification, etc.
- two on-chip phase lock loops (PLLs)
- programmable I/O drive capability
- built-in temperature sensor

key specifications (typical)

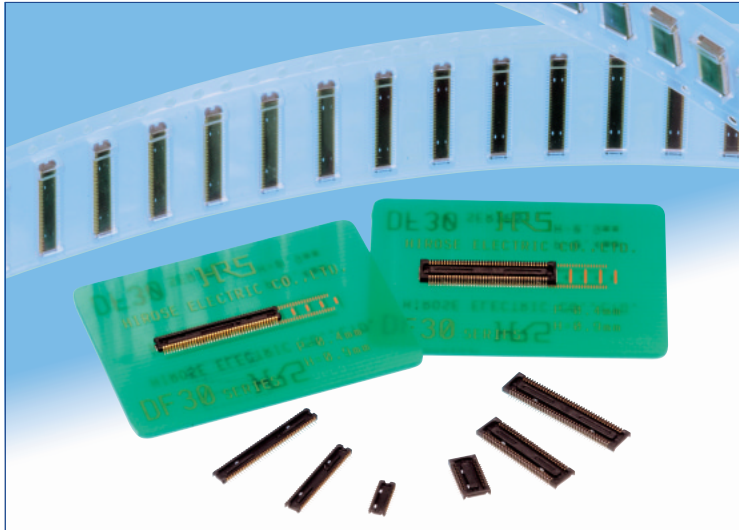
- **active array size:** 2688 x 1520
- **power supply:**
 - core: 1.1 ~ 1.3V
 - analog: 2.6 ~ 3.0V
 - I/O: 1.7 ~ 3.0V
- **power requirements:**
 - active: 163 mA (261 mW)
 - standby: 1 mA
 - XSHUTDOWN: <10 μ A
- **temperature range:**
 - operating: -30°C to +85°C junction temperature (see [table 7-2](#))
 - stable image: 0°C to +60°C junction temperature (see [table 7-2](#))
- **output formats:** 10-bit RAW
- **lens size:** 1/3"
- **input clock frequency:** 6~64 MHz
- **lens chief ray angle:** 9°
- **max S/N ratio:** 38.3 dB
- **dynamic range:** 64.6 dB @ 1x gain
- **maximum image transfer rate:**
 - 2688x1520: 30 fps (see [table 2-1](#))
 - 1280x720: 180 fps (see [table 2-1](#))
 - 1920x1080: 120 fps (see [table 2-1](#))
 - 672x380: 330 fps (see [table 2-1](#))
- **sensitivity:** 1900 mV/Lux-sec
- **scan mode:** progressive
- **maximum exposure interval:** 1548 \times T_{ROW}
- **pixel size:** 2 μ m x 2 μ m
- **dark current:** 4mV/sec @ 60°C junction temperature
- **image area:** 5440 μ m x 3072 μ m
- **package dimensions:** 6630 μ m x 5830 μ m



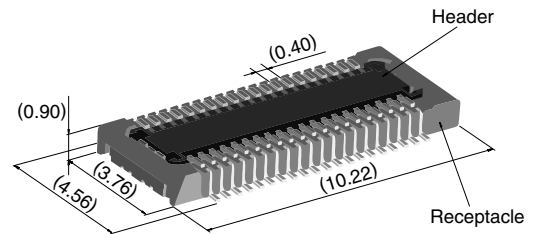
note Higher junction temperature degrades image quality

0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-FPC Connectors

DF30 Series



Extremely small size



40 positions shown

Overview

Continuous miniaturization and increased component density on PCB created demand for extremely low profile connectors. This series is addition of a new extremely low profile connectors to Hirose's wide range of high reliability board-to-board/board-to-FPC connection solutions.

Features

1. Contact reliability

Concentration of the contact's normal forces at the single point assures good contact wipe and electrical reliability, while confirming the fully mated condition with a definite tactile click.

2. Self alignment

Recognizing the difficulties of mating extremely small connectors in limited spaces the connectors will self align in horizontal axis within 0.3 mm.

3. Automatic board placement

Packaged on tape-and-reel the plug and headers have sufficiently large flat areas to allow pick-up with vacuum nozzles of automatic placement equipment.

4. Variety of contact positions and styles

Available in standard contact positions of: 20, 22, 24, 30, 34, 40, 50, 60, 70 and 80 with and without metal fittings. Addition of metal fittings does not affect external dimensions of the connectors.

Smaller contact positions are also available.

5. Support for continuity test connector

Connectors which have increased insertion and removal durability are available for continuity tests. Contact your Hirose sales representative for details.

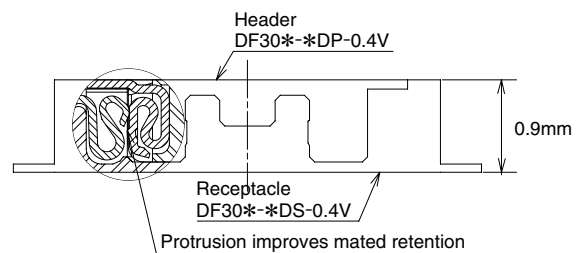
Applications

Cellular phones, PDA's, mobile computers, digital cameras, digital video cameras, and other devices demanding high reliability connections in extremely limited spaces.

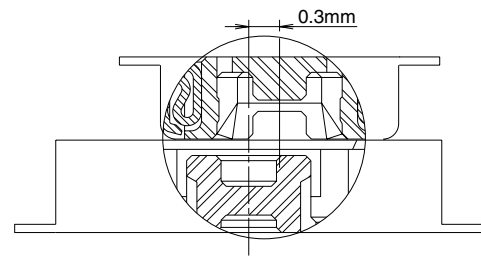
Low profile

Increased mated retention

High contact reliability



Self alignment



Product Specifications

Rating	Rated current 0.3A Rated voltage 30V AC	Operating temperature range : -35°C to 85°C (Note 1) Operating humidity range : Relative humidity 20% to 80%	Storage temperature range -10°C to 60°C (Note 2) Storage humidity range Relative humidity 40% to 70% (Note 2)
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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 1 μs or more	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis
5. Humidity	Contact resistance: 100 mΩ max. Insulation resistance: 25 MΩ min.	96 hours at temperature of 40°C±2°C and RH of 90% to 95%
6. Temperature cycle	Contact resistance: 100 mΩ max. Insulation resistance: 50 MΩ min.	Temperature: -55°C→+5°C to +35°C→+85°C→+5°C to +35°C Duration: 30→10→30→10(Minutes) 5 cycles
7. Durability (insertions/withdrawals)	Contact resistance: 100 mΩ max.	50 cycles(Connector for conductivity tests: 500 cycles)
8. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 300°C for 3 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.

Materials and Finishes

Connectors	Component	Material	Finish	Remarks
Receptacles and Headers	Insulator	LCP	Color : Black	UL94V-0
	Contacts	Phosphor bronze	Gold plated	————
	Metal fittings	Phosphor bronze	Tin-copper plated	————

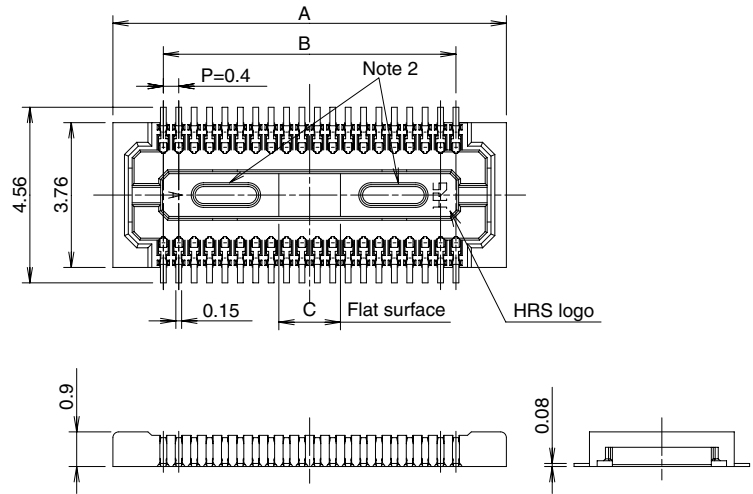
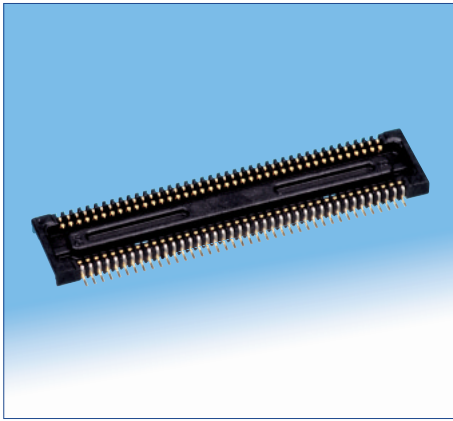
Ordering information

Receptacles and Headers

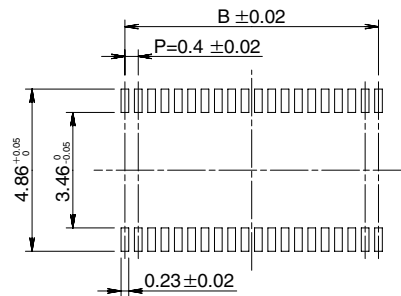
DF30 **FC** - ***** **DS - 0.4** **V** **(**)**
 ① ② ③ ④ ⑤ ⑥ ⑦

① Series name: DF30	⑤ Contact pitch: 0.4 mm
② Configuration FB: With metal fittings, without bosses FC: Without metal fittings, without bosses CJ: Connector for conductivity tests	⑥ Termination section V: Straight SMT
③ Number of positions: 20, 22, 24, 30, 34, 40, 50, 60, 70, 80	⑦ Packaging (81): Embossed tape packaging (5,000 pieces per reel) (82): Embossed tape packaging (1,000 pieces per reel)
④ Connector type DS: Double row receptacle DP: Double row header	

■ Receptacles (without metal fittings)



◆ Recommended PCB mounting pattern



Recommended solder paste thickness: 120 μ m

[Specification number] -**, (**)
(81): Embossed tape packaging (5,000 pieces per reel)

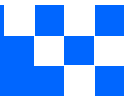
* Tolerances non- accumulative.

Unit: mm

Part Number	CL No.	Number of contacts	A	B	C
DF30FC-20DS-0.4V(**)	CL684-1109-8-**	20	6.22	3.6	1.2
DF30FC-22DS-0.4V(**)	CL684-1110-7-**	22	6.62	4.0	1.2
DF30FC-24DS-0.4V(**)	CL684-1111-0-**	24	7.02	4.4	1.2
DF30FC-30DS-0.4V(**)	CL684-1112-2-**	30	8.22	5.6	1.2
DF30FC-34DS-0.4V(**)	CL684-1113-5-**	34	9.02	6.4	1.36
DF30FC-40DS-0.4V(**)	CL684-1078-6-**	40	10.22	7.6	1.6
DF30FC-50DS-0.4V(**)	CL684-1114-8-**	50	12.22	9.6	2.0
DF30FC-60DS-0.4V(**)	CL684-1082-3-**	60	14.22	11.6	2.4
DF30FC-70DS-0.4V(**)	CL684-1115-0-**	70	16.22	13.6	2.8
DF30FC-80DS-0.4V(**)	CL684-1116-3-**	80	18.22	15.6	3.2

Note 1: Order by number of reels.

Note 2: Receptacles with 24 or fewer contacts positions will not have recessed areas.



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Cameras Applications



Automotive Driver Pilot



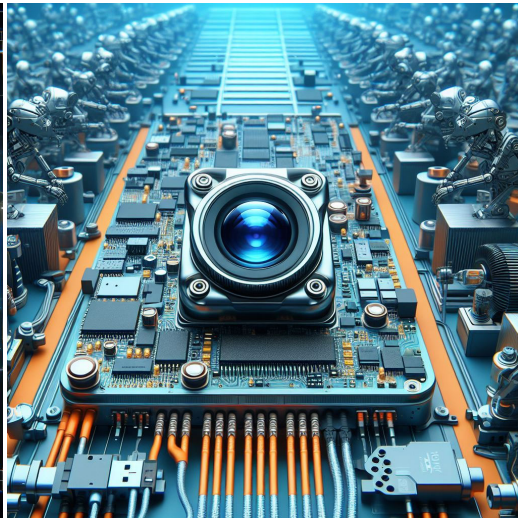
Live Streaming



Video Conference



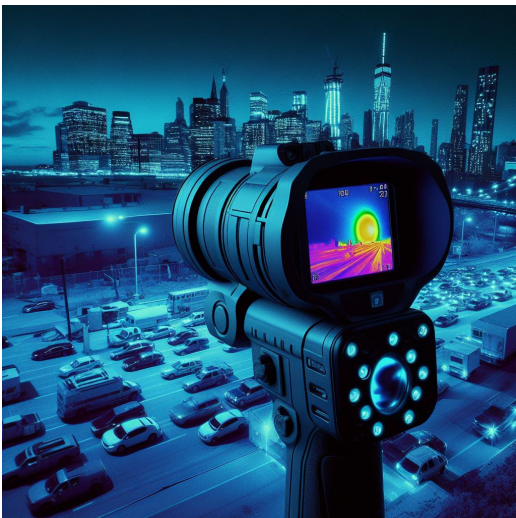
Eye Tracker Biometric Detection



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

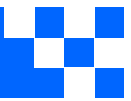
OmniVision	Sony	Samsung	On-Semi	Aptina	Himax	GalaxyCore	PixArt	SmartSens	Sensors	
Pin Signal										
Description										
DGND	GND									ground for digital circuit
AGND										ground for analog circuit
PCLK	DCK									DVP PCLK output
XCLR	PWDN	XSHUTDOWN	STANDBY							power down active high with 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										
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



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



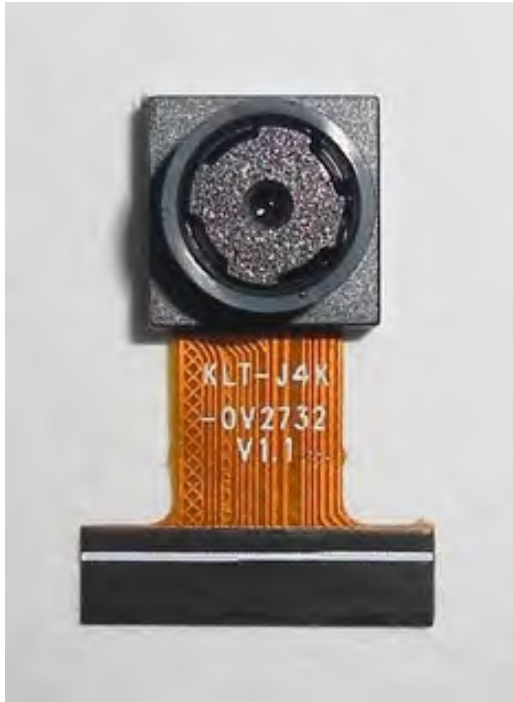


Inspection Item		Inspection Method	Standard of Inspection		
Category	Item				
Appearance	FPC/ PCB	Color	The Naked Eye	Major Difference is Not Allowed.	
		Be Torn/Chopped	The Naked Eye	Copper Crack Exposure is Not Allowed.	
		Marking	The Naked Eye	Clear, Recognizable (Within 30cm Distance)	
	Holder	Scratches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



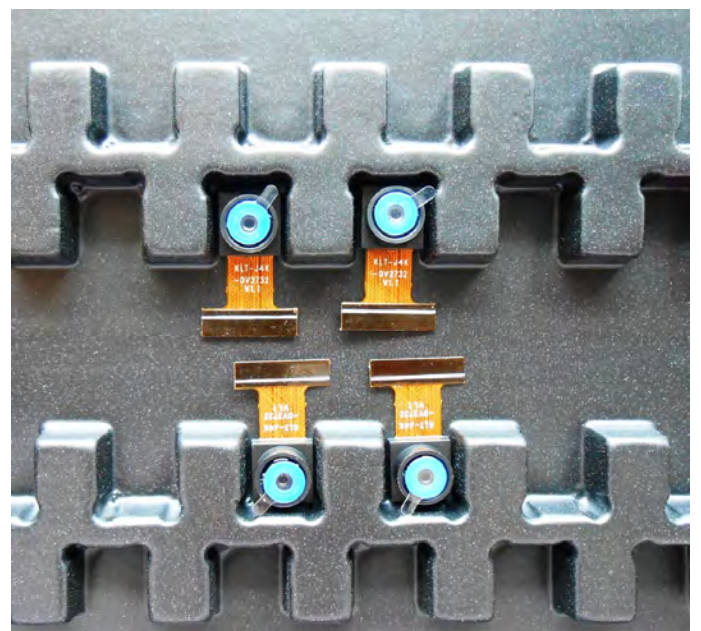
Complete with Lens Protection Film



Tray with Grid and Space



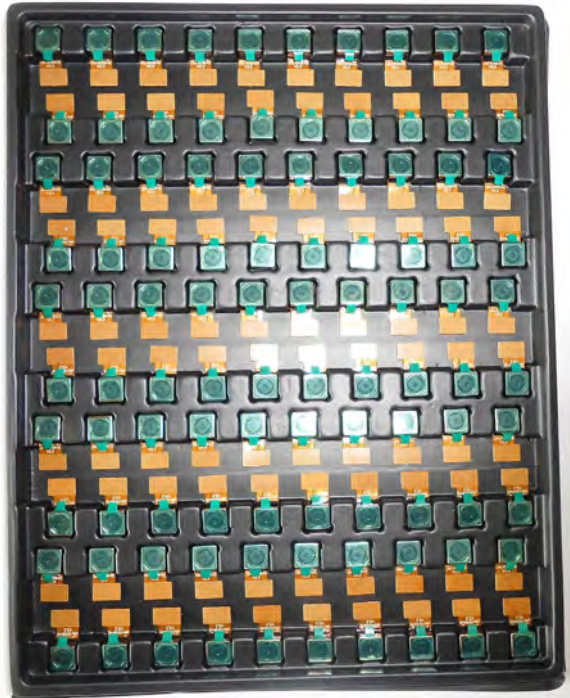
Place Cameras on the Tray





Camera Modules Package Solution

Full Tray of Cameras



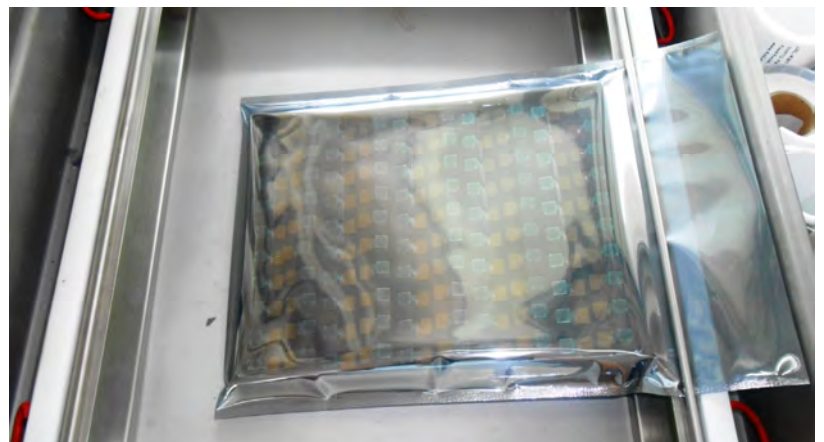
Cover Tray with Lid



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





your BEST camera module partner

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

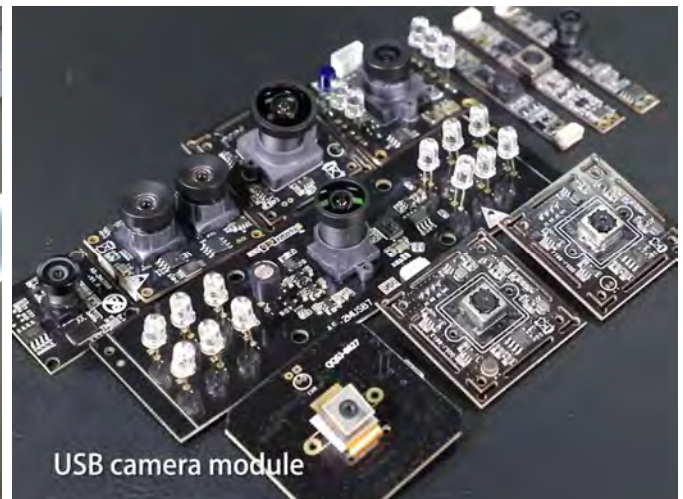


Company Kai Lap Technologies (KLT)

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. 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.





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