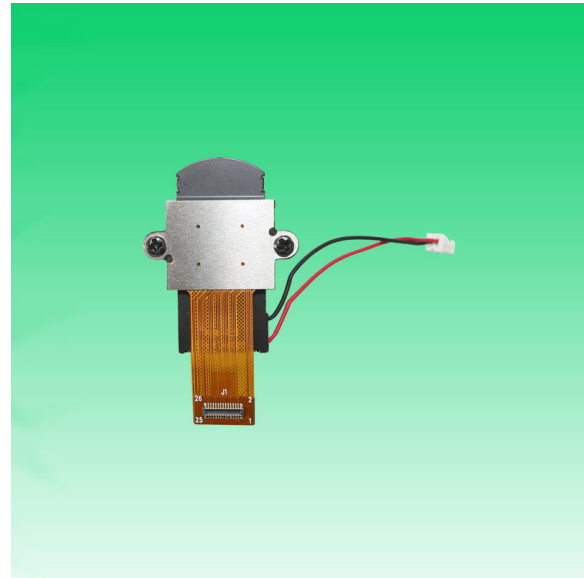
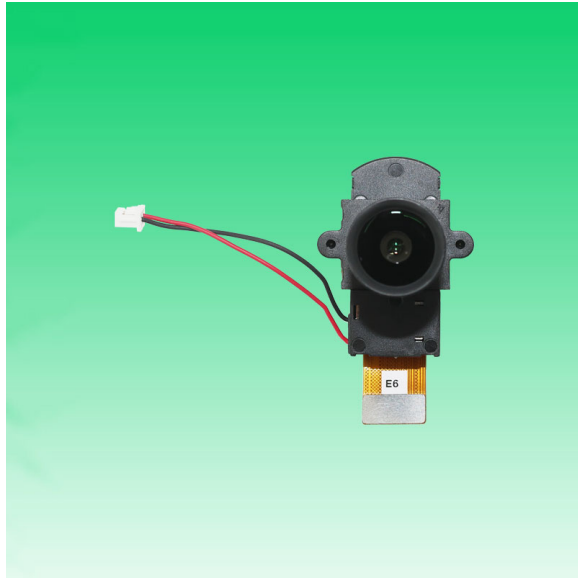


**KLT-IRSW-OS05A20 V4.2****5MP OmniVision OS05A20 IR Switch MIPI Interface Fixed Focus Camera Module**

<b>Camera Module No.</b>	<b>KLT-IRSW-OS05A20 V4.2</b>
<b>Resolution</b>	5MP
<b>Image Sensor</b>	OS05A20
<b>Sensor Type</b>	1/2.7"
<b>Pixel Size</b>	2.0 um x 2.0 um
<b>EFL</b>	4.15 mm
<b>F.NO</b>	1.60
<b>Pixel</b>	2688 x 1944
<b>View Angle</b>	106.0°(DFOV) 90.6°(HFOV) 46.4°(VFOV)
<b>Lens Dimensions</b>	20.00 x 14.00 x 23.05 mm
<b>Module Size</b>	43.00 x 24.50 mm
<b>Module Type</b>	Fixed Focus
<b>IR Switch Input Voltage</b>	3.3V - 5.5V
<b>Lens Filter IR Frequency</b>	645nm +/- 15nm
<b>Lens Filter AR Frequency</b>	700nm - 1,000nm
<b>Operation (IR Day Time)</b>	Red Line: Negative Black Line: Positive
<b>Operation (AR Night Time)</b>	Red Line: Positive Black Line: Negative
<b>IR Switch Connector</b>	962-10231-030005 (2 Pin)
<b>Interface</b>	MIPI
<b>Operating Temperature</b>	-30°C to +85°C
<b>Mating Connector</b>	WP7A-S026VA1



## KLT-IRSW-OS05A20 V4.2

5MP OmniVision OS05A20 IR Switch MIPI Interface Fixed Focus Camera Module



Top View



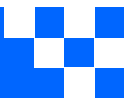
Side View



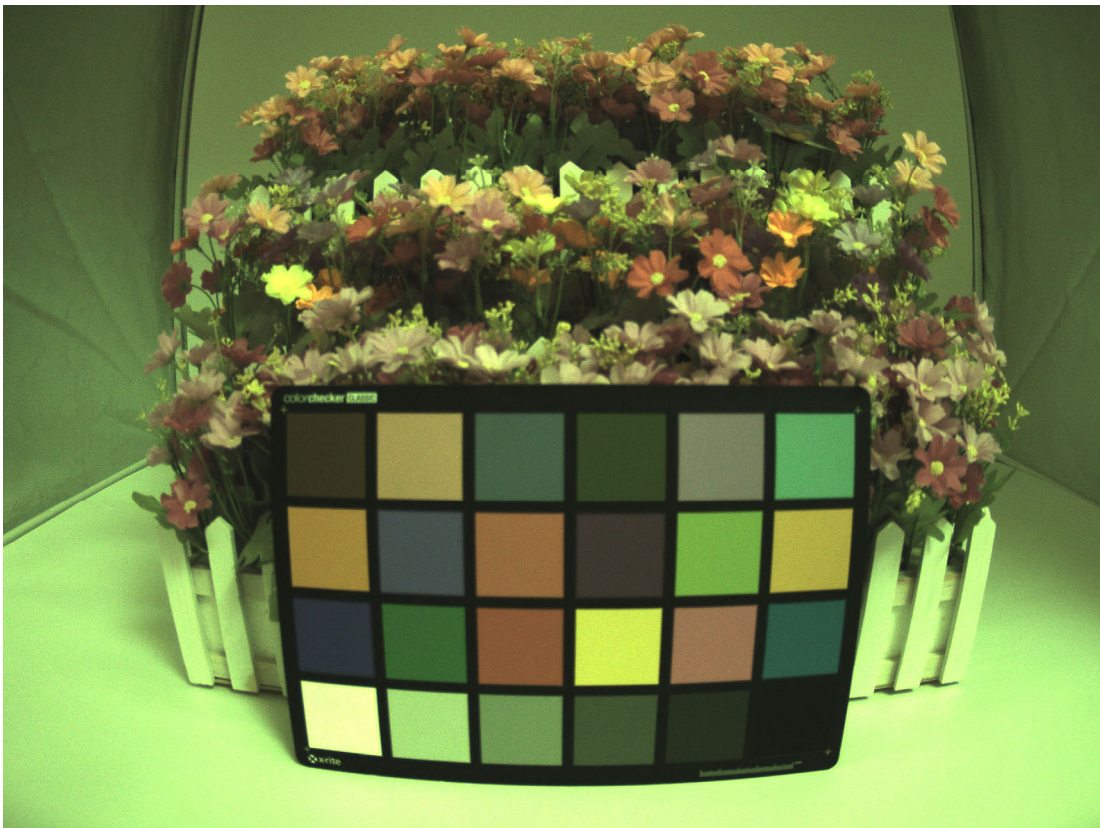
Bottom View

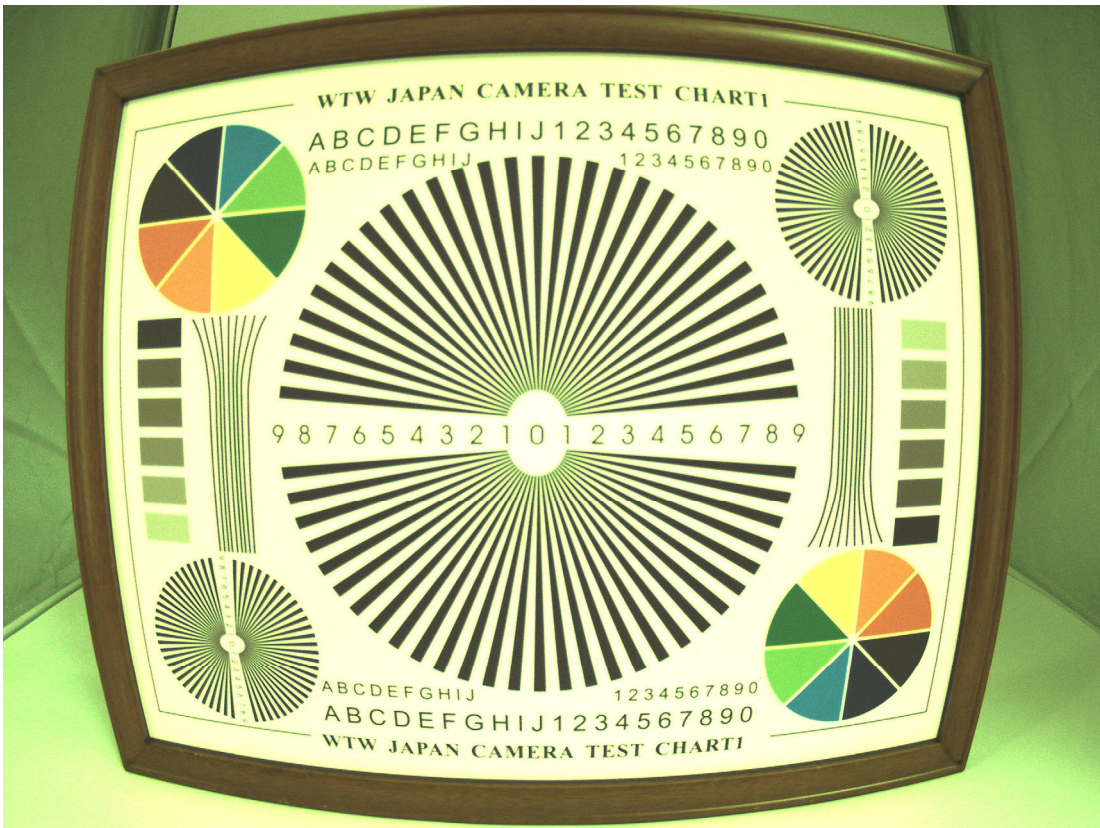


Mating Connector



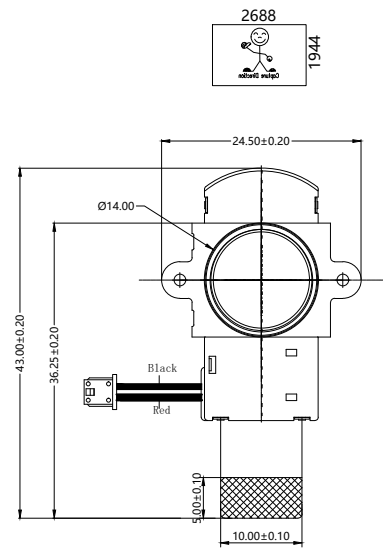
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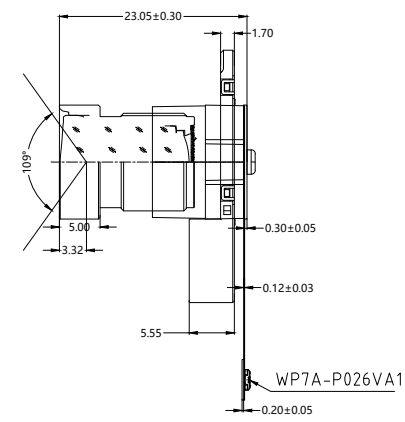


RoHS	
PIN	SIGNAL
1	AGND
2	DGND
3	AVDD 2.8V
4	MDN3
5	DVDD 1.2V
6	MDP3
7	DOVDD 1.8V
8	DGND
9	PWDN
10	MDN2
11	RST
12	MDP2
13	SCL
14	DGND
15	SDA
16	MDN1
17	MCLK
18	MDP1
19	DGND
20	DGND
21	MCP
22	MDN0
23	MCN
24	MDP0
25	DGND
26	DGND

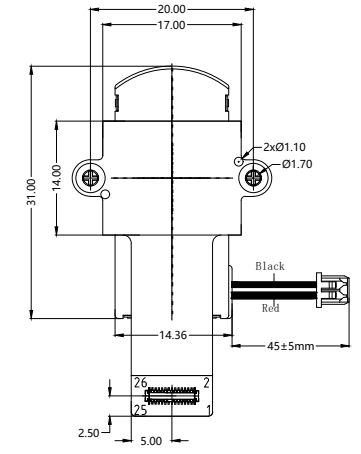
Version	Information
V1.0	First Version
V2.0	Connector changed
V3.0	Change lens and IR CUT
V4.0	Change Pin assignment
V4.2	Change lens



TOP VIEW



SIDE VIEW



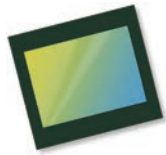
BOTTOM VIEW

NOTE:  
1.The device slave address:0x6C(w);0x6D(r)

Parameter:  
1、 Sensor specification:  
Image Sensor: OS05A20  
Pixel: 2um\*2um  
Lens Type: 1/2.7  
Important Voltage Description:  
DVDD1.2V (external power supply);

2、 Lens specification:  
FOV: 109°(D);90.6°(H);46.4°(V);  
F/NO.: 1.6  
TV distortion: < -13.94%  
Focal length: 4.15mm  
Composition: 1G4P+IR CUT

<h1>Kai Lap Technologies Group Ltd</h1>					
Designed By	Kevin	Model Name:	KLT-IRSW-OS05A20 V4.2		
Checked By	Jacky	Projection Type:	Unit: mm	Date: 5/20/2024	
			Scale: 1:1	Sheet: 1 of 1	Version: 1/0



# OS05A20 5-megapixel product brief



available in  
a lead-free  
package

## New OS05A20 Uses Nyxel® Technology to Bring Superior Image Quality to Video Surveillance Cameras Day or Night

The 5-megapixel OS05A20 is the world's first image sensor to implement Nyxel® technology, OmniVision's breakthrough near-infrared (NIR) technology that allows image sensors to see better and farther under low- and no-light conditions. By using Nyxel® technology and a 2 x 2 micron pixel, the OS05A20 PureCel® image sensor has the unique ability to capture high-quality, high-resolution day or night, making it ideally suited for professional surveillance systems.

Nyxel® technology combines thick-silicon pixel architectures with extended deep trench isolation (DTI) to improve quantum efficiency (QE) up to 3x for 850 nm sensitivity and up to 5x for 940 nm sensitivity, while

maintaining all other image-quality metrics. These improvements deliver unrivaled image quality, extended image-detection range and a reduced light-source requirement, leading to lower power consumption.

Available in a 1/2.7-inch optical format, the OS05A20 is capable of capturing full-resolution 2688 x 1944 video at 60 frames per second (fps), 1080p full high definition (HD) video at 120 fps, and 720p HD video at 180 fps. The sensor comes in a chip scale package (CSP).

Find out more at [www.ovt.com](http://www.ovt.com).



## Applications

- Security Cameras
- High Resolution Consumer Cameras
- Action Cameras

## Product Features

- 2  $\mu\text{m}$  x 2  $\mu\text{m}$  pixel
- optical size of 1/2.7"
- QE enhancement in 850 nm and 940 nm
- programmable controls for:
  - frame rate
  - mirror and flip
  - cropping
  - windowing
- supports output formats:
  - 12-/10-bit RAW RGB
- supports images sizes:
  - 2688 x 1944
  - 1080p (1920x1080)
  - 720p (1280x720)
- supports 2x2 binning
- standard serial SCCB interface
- 12/10-bit ADC
- up to 4-lane MIPI/LVDS serial output interface (supports maximum speed up to 1500 Mbps/lane)
- 2-exposure staggered HDR support
- programmable I/O drive capability
- light sensing mode (LSM)
- PLL with SCC support
- support for frame sync

# OS05A20



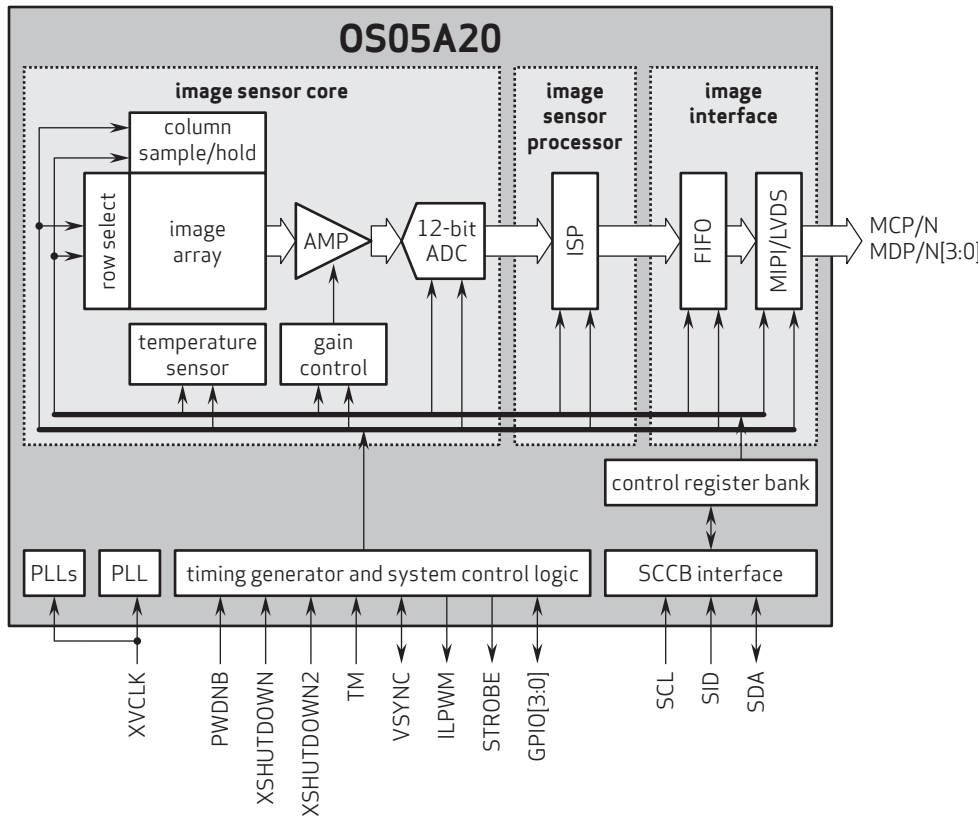
## Ordering Information

- OS05A20-H73A-1B (color, lead-free) 73-pin CSP
- OS05A20-H73A-1C (color, lead-free) 73-pin CSP

## Technical Specifications

- active array size: 2688 x 1944
- maximum image transfer rate:
  - 2688 x 1944: 60 fps
  - 2688 x 1520: 60 fps
- power supply:
  - core: 1.2V
  - analog: 2.8V
  - I/O: 1.8V
- power requirements:
  - active: 210 mW
  - standby: 2 mA
  - XSHUTDOWN: 2  $\mu\text{A}$
- temperature range:
  - operating: -30°C to +85°C junction temperature
  - stable image: 0°C to +60°C junction temperature
- output formats: 10/12-bit RGB RAW
- lens size: 1/2.7"
- lens chief ray angle: 11° linear
- scan mode: progressive
- pixel size: 2.0  $\mu\text{m}$  x 2.0  $\mu\text{m}$
- image area: 5434.56  $\mu\text{m}$  x 3948.05  $\mu\text{m}$

## Functional Block Diagram



4275 Burton Drive  
Santa Clara, CA 95054  
USA

Tel: + 1 408 567 3000  
Fax: + 1 408 567 3001  
www.ovt.com

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OmniVision

**NEW**



0.4mm Pitch, Stacking Type  
Board-to-Board (FPC) Connector

CONNECTOR

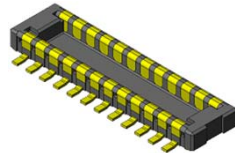
MB-0228-3

September 2017

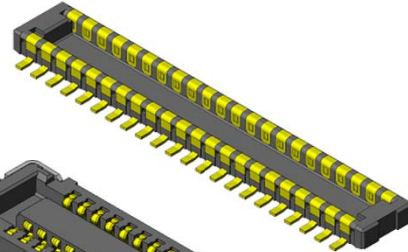
# WP7 Series

**RoHS Compliant**

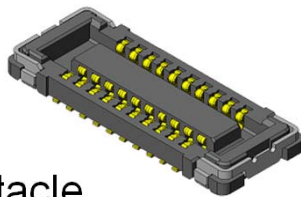
Plug



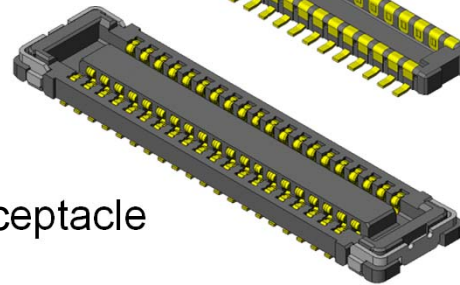
Plug



Receptacle



Receptacle



The WP7 Series is a low-profile board-to-board (FPC) connector with 0.4mm pitch spacing that is ideal for high-density mounting in slim information communication devices like mobile phones, smartphones, LCD, and notebook PC.

To satisfy different product function requirements, a low pin count type and a high pin count type (WP7A / WP7B) are available with the same mounting pattern.

## Features

- 0.4mm pitch, 2 rows, 0.7mm stacking height.
- Contact structure ensures high wear-resistance and high contact reliability.
- Secure hold-downs prevent insulator breakage and peeling from FPC.
- 2-point contact design to resist twisting stress.
- Pb-free (Ni barrier on contact prevents solder wicking.)
- Receptacle contacts adopt an optimal configuration according to the pin counts.  
High removal force WP7A (low pin count: 10-32 pos.)  
Low insertion force WP7B (high pin count 34-70 pos.)
- Signal contact supports 10 Gbps transmission rate.
- Supports MIPI, USB3.1 Gen2, and PCIe Gen3 transmission.

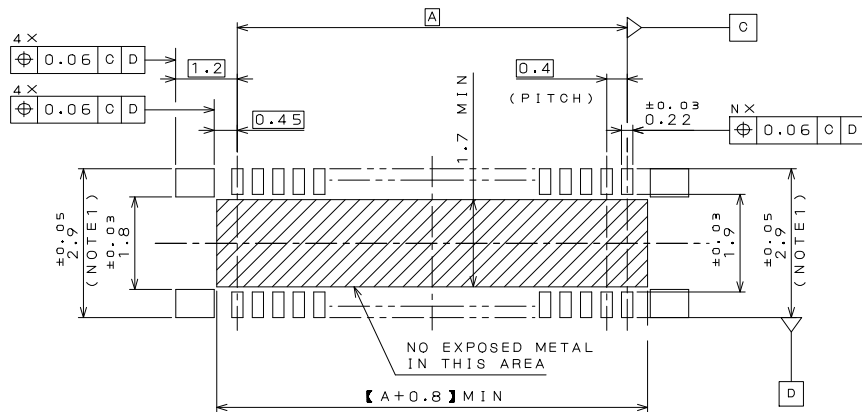
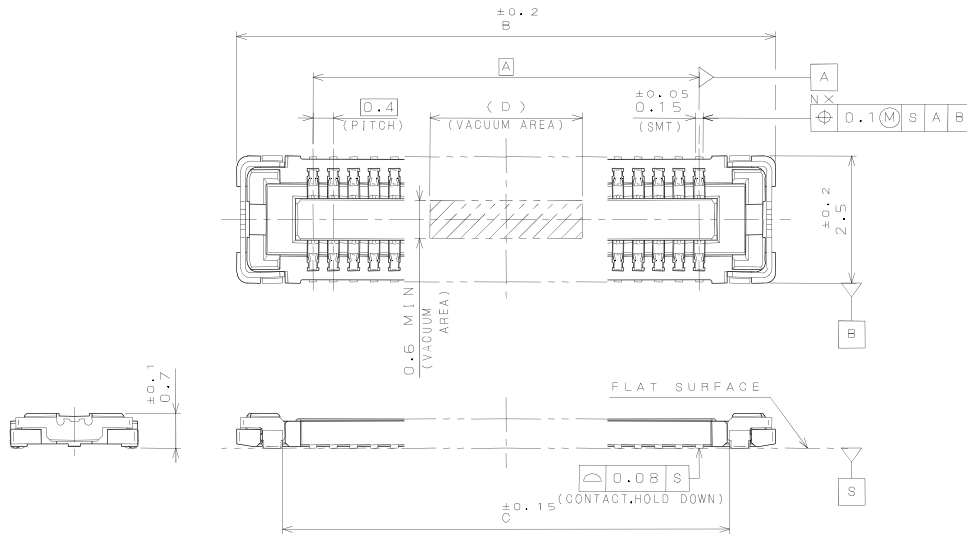
## General Specifications

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>■(WP7A) No. of Contacts:<br/>10, 16, 20, 22, 24, 26,<br/>28, 30, 32 pos.</li> <li>■(WP7B) No. of Contacts:<br/>34, 40, 50, 60, 70 pos.</li> <li>■Pitch: 0.4mm, 2 rows</li> <li>■Operating Temperature:<br/>-40 Deg. C to +85 Deg. C</li> <li>■Contact Resistance:<br/>70mΩ max. (initial)</li> <li>■Life Time: 30 mating cycles</li> </ul> | <ul style="list-style-type: none"> <li>■Rated Current: AC, DC 0.3A each per terminal</li> <li>■Rated Voltage: AC, DC 50V</li> <li>■Insulation Resistance: 100MΩ min. (initial)</li> <li>■Dielectric Withstanding Voltage:<br/>AC250Vr.m.s for 1 minute</li> <li>■(WP7A) total insertion force:<br/>1.50N x n max. (n: No. of pos.)</li> <li>■(WP7A) total removal force:<br/>0.15N x n min. (n: No. of pos.)</li> <li>■(WP7B) total insertion force:<br/>1.00N x n max. (n: No. of pos.)</li> <li>■(WP7B) total removal force:<br/>0.10N x n min. (n: No. of pos.)</li> </ul> |
|---|---|



Part Number	WP7A-S***VA1
SJ Drawing	SJ111877

# WP7A Receptacle



APPLICABLE P.C.B. DIMENSION (REF.)  
適合基板寸法 (参考)

DIMENSIONS 寸法 NUMBER OF CONTACT 芯数	DIMENSIONS			
	A	B	C	D
10	1.6	4.6	2.8	2.0
16	2.8	5.8	4.0	2.0
20	3.6	6.6	4.8	2.0
22	4.0	7.0	5.2	2.0
24	4.4	7.4	5.6	2.0
26	4.8	7.8	6.0	5.0
28	5.2	8.2	6.4	5.0
30	5.6	8.6	6.8	5.0
32	6.0	9.0	7.2	5.0

Note 1) Dimension 3.5 ± 0.05 is recommended in case repair is needed.



## Cameras Applications



Automotive Driver Pilot



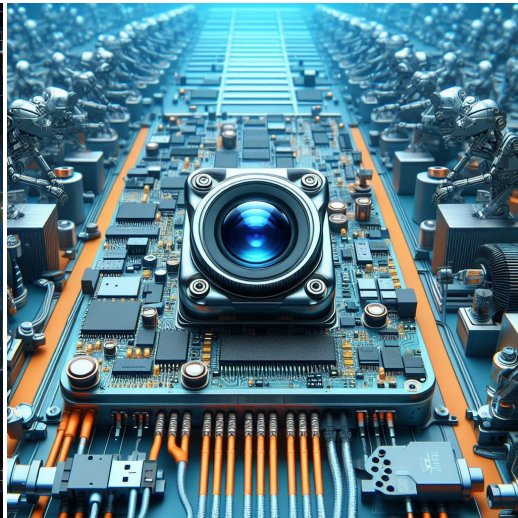
Live Streaming



Video Conference



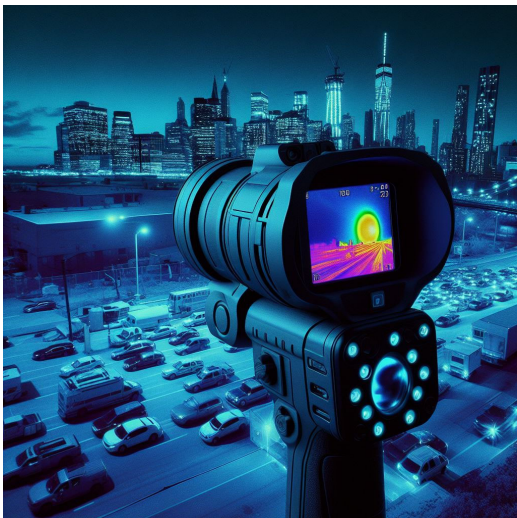
Eye Tracker Biometric Detection



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								
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



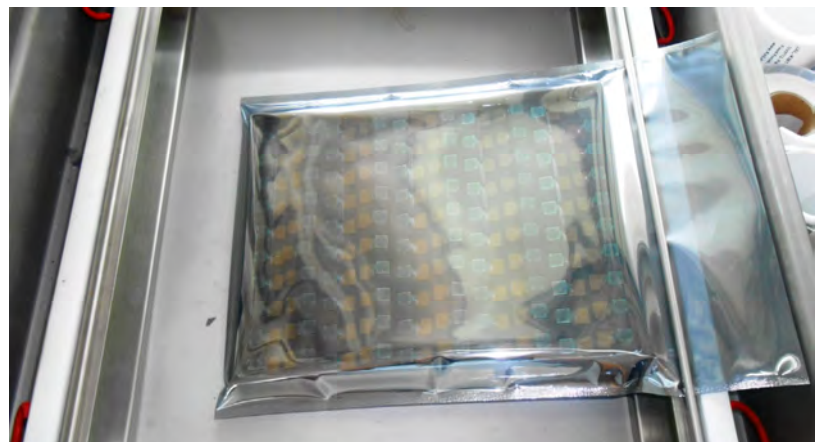
Cover Tray with Lid



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

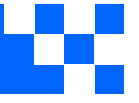


Place Foam Sheets and Trays into Box



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





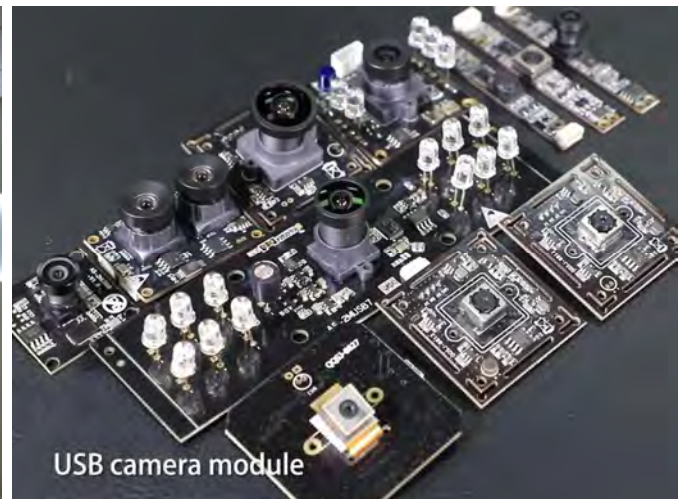
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## Company Kai Lap Technologies (KLT)

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



[www.KaiLapTech.com](http://www.KaiLapTech.com) [sales@KaiLapTech.com](mailto:sales@KaiLapTech.com) Tel: (852) 6908 1256 Fax: (852) 3017 6778

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