

KLT-3AMF-SC501AI V1.0

5MP SmartSens SC501AI MIPI Interface M12 Fixed Focus Camera Module



Front View



Back View

Specifications

Camera Module No.	KLT-3AMF-SC501AI V1.0
Resolution	5MP
Image Sensor	SC501AI
Sensor Type	1/2.7"
Pixel Size	2.0 um x 2.0 um
EFL	3.00 mm
F.NO	2.00
Pixel	2880 x 1620
View Angle	142.0°(DFOV) 100.0°(HFOV) 73.0°(VFOV)
Lens Dimensions	13.60 x 13.60 x 18.00 mm
Module Size	40.05 x 13.70 mm
Module Type	Fixed Focus
Interface	MIPI
Auto Focus VCM Driver IC	None
Lens Model	KLT-LENS-MJ7010A
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +85°C
Mating Connector	DF30FC-30DS-0.4V



KLT-3AMF-SC501AI V1.0

5MP SmartSens SC501AI MIPI Interface M12 Fixed Focus Camera Module



Top View



Side View

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Bottom View

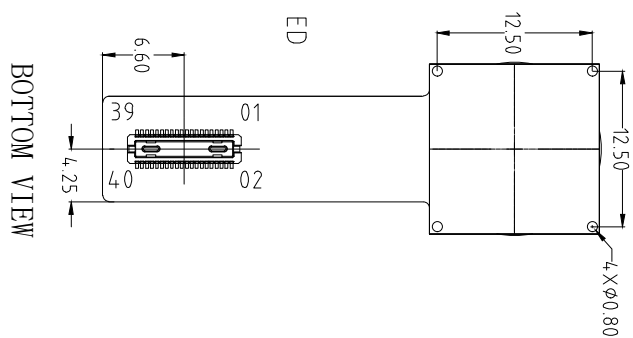
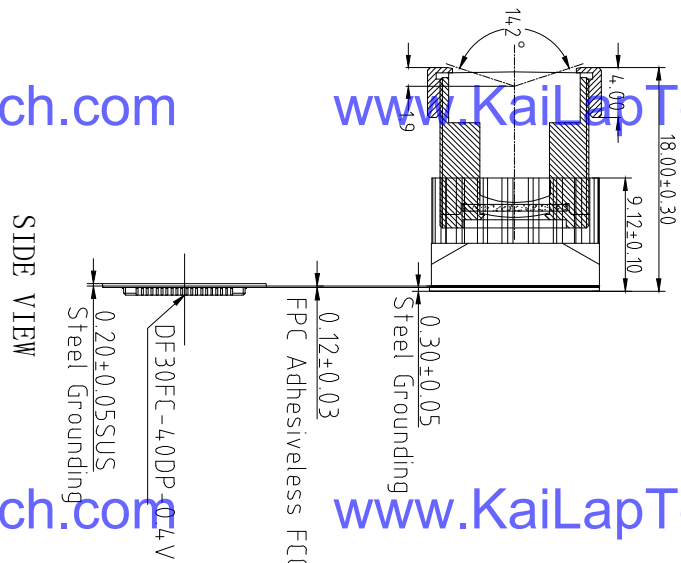
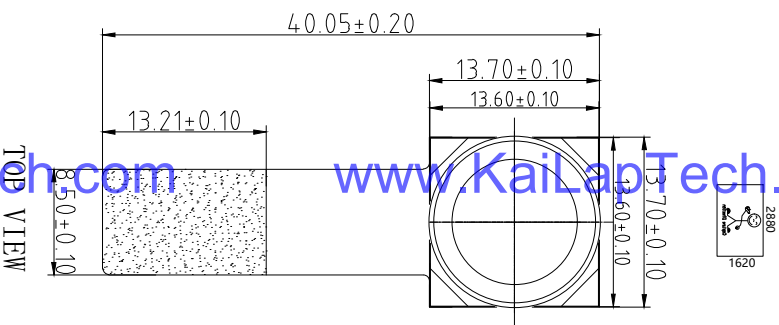


Mating Connector

ROHS

1	AGND
2	NC
3	NC
4	NC
5	SIOD
6	FSYNC
7	SIOC
8	AVDD2.8V
9	XSHUTDN
10	MDP2
11	NC
12	MDN2
13	DGND
14	DGND
15	FSYNC
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	NC
30	MDN0
31	NC
32	DGND
33	NC
34	MCLK
35	MDP3
36	DVDD1.2V
37	MDN3
38	DOVDD1.8V
39	DGND
40	DGND

NOTE:
1. The device slave address: 7'h30



Parameters:

1. Sensor specification:

Image Sensor: SC501AI
Pixel: 2.0um×2.0um
Lens Type: 1/2.7
Important Voltage Description: DVDD1.2V (external power supply);

2. Lens specification:

FOV: 142°(D);100°(H);73°(V)
F/NO: 2.0
TV distortion: <35%
Focal length: 3.0mm
Composition: 5E+IR FILTER
IR Cut Coating: 650nm±10nm@50%

Kai Lap Technologies Group Ltd

Designed By	Kevin	Model Name:	KLT-3AMF-SC501AI V1.0
Checked By	Aouly Yan	Projection Type:	Third Angle
		Unit:	mm
		Scale:	1:1
		Sheet:	1 of 1
		Version:	1/0

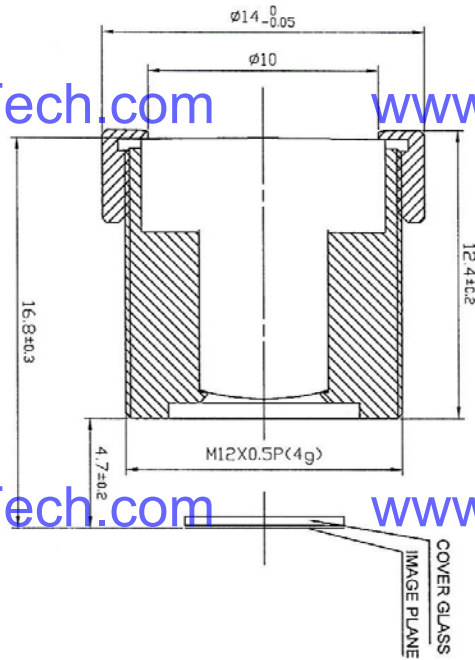
Version	Information	Date
V1.0	First Version	3-25-2021



Lens Model: KLT-LENS-MJ7010A

SPECIFICATION

1. FOR 1/3" SENSOR
2. IMAGE HEIGHT $\phi 6.4$
3. EFL=3mm
4. WORKING F/NO.=2.0
5. BFL=4.7mm
6. FOV=14.2°
7. DISTORTION=35%
8. RELATIVE ILLUMINATION=70%(V=1)
9. CONSTRUCTION: SE
10. THREAD :M12X0.5P
11. IR FILTER 650±10nm

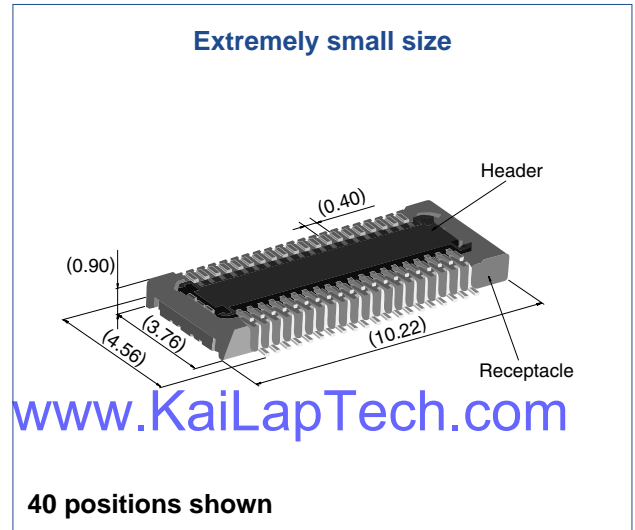
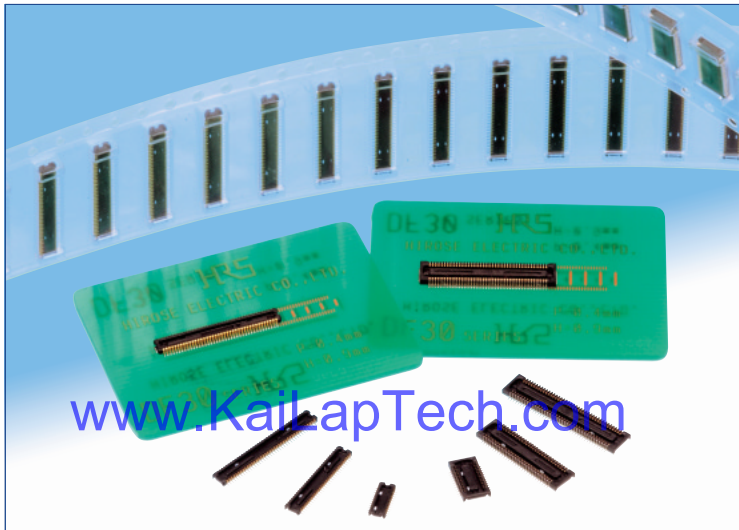


①	修訂記錄 REVISION RECORD	姓名 NAME	日期 DATE	單位 UNIT	比例 SCALE	圖形縮碼 DRAWING NO.	圖次 REV.	日期 DATE
②					12:1		A-01	
③								
④								
⑤								

公差
NOTES TOLERANCE
 XX = ±0.15
 XX = ±0.05
 XX = ±0.03
 XX = ±0.5°
 3RD ANGLE PROJ.
 材料
MATERIAL
 圖次
REV.
 日期
DATE
 檢核
CHECKED
 日期
DATE

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

DF30 Series



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.



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

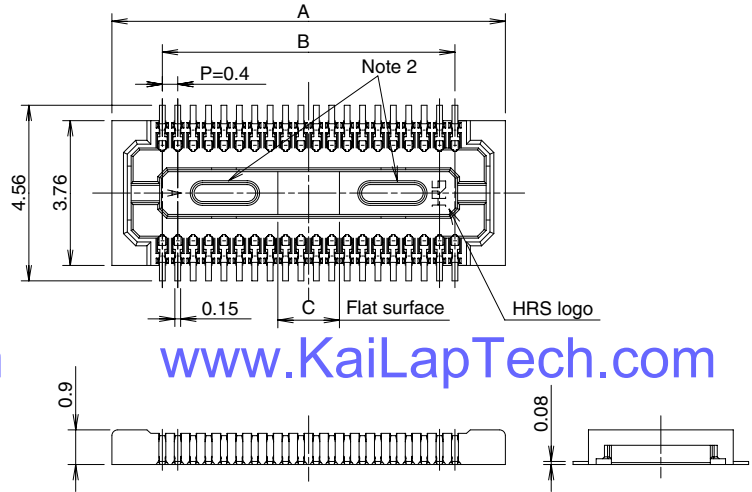
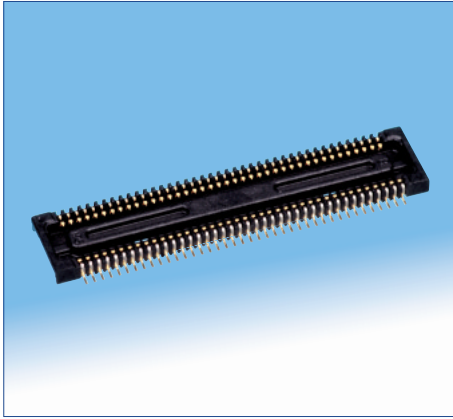
● Receptacles and Headers

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	

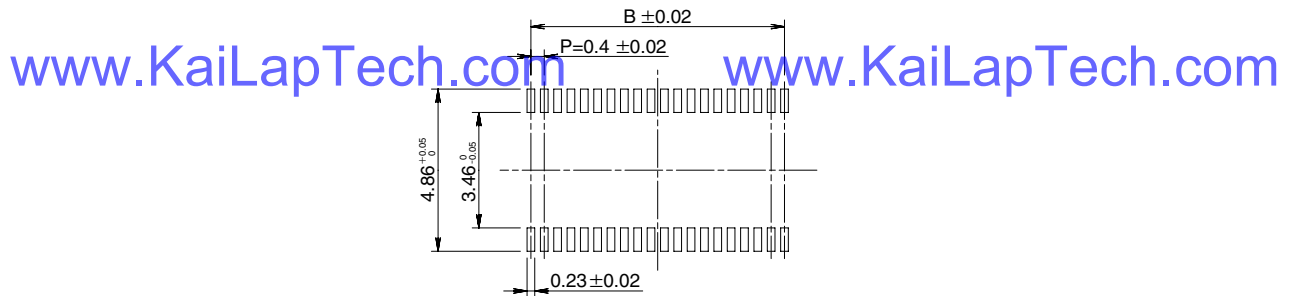
■ Receptacles (without metal fittings)



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◆ Recommended PCB mounting pattern



Recommended solder paste thickness: 120 μ m

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

* 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.



SMARTSENS

CMOS图像传感器

CMOS IMAGE SENSOR

SC501AI 产品单页

SC501AI Product Flyer

- 高性能16:9宽画幅3K视频输出
High performance 16:9 aspect ratio 3K video output
- 暗光、色彩全性能提升
More improved performance,
specifically low-light imaging and color expression



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公司简介 | Company Profile

思特威(上海)电子科技股份有限公司(SmartSens Technology)是一家从事CMOS图像传感器芯片产品研发、设计及服务的高新技术企业,2011年创立,总部设立于中国上海,在北京、深圳、杭州、香港、新竹以及美国圣何塞等多个城市设有研发中心与销售办公室,网络遍及全球。

思特威以创新为驱动,专注于为客户提供面向未来和全球领先的CMOS图像传感器芯片产品。凭借一支精于创新、覆盖全球的研发团队,思特威自主研发出了优秀的夜视全彩技术、独创领先的DSI技术、Stack BSI的全局曝光技术等诸多卓越技术。

自成立以来,思特威一直以客户需求为核心,致力于为客户提供高质量的视频解决方案。公司产品也不断成熟并逐步确立了安防领域行业领先地位,产品遍及安防监控、车载影像、机器视觉及消费类电子产品(运动相机、无人机、扫地机器人、智能家用摄像头)等应用领域。2017年起,思特威已连续多年在CIS产品安防领域全球市场占有率上保持第一,并在机器视觉、人工智能应用等新兴领域不断拓展创新。

SmartSens Technology(Shanghai) Co., Ltd. is a high-performance CMOS image sensing (CIS) chip design company. The company, founded in 2011, is headquartered in Shanghai and has both research centers and sales offices in various cities around the world, including Beijing, Shenzhen, Hangzhou, Hong Kong, Hsinchu and San Jose, California. SmartSens is dedicated to providing future-oriented and world-leading CMOS image sensing products. With an international and accomplished research team, SmartSens owns a suite of proprietary technologies, including full color night vision, DSI Pixel, global exposure built on voltage domain architecture and Stack BSI processes, among many others.

SmartSens has always kept the needs of the customer first, constantly innovating with the goal of providing the customer with high-quality video capturing solutions, with products in Security & Surveillance, Automotive, Machine Vision, Consumer Electronics (sports cameras, drones, automatic vacuums, smart home), and other application fields. Since 2017, SmartSens has maintained its lead in the CIS Security & Surveillance global market share for two consecutive years, and it has had achievements in machine vision, artificial intelligence, among other applications.

规格说明 | Specifications

项目 Item	参数 Parameters
Resolution	5MP
Pixel Array	2888H x 1628V
Pixel Size	2.0µm x 2.0µm
Optical Format	1/2.7"
Max Frame Rate	2880H x 1620V@30fps
Output Interface	8/10-bit 1/2/4 Lane MIPI
Output Format	RAW RGB
CRA	15°
Sensitivity	3628mV/LUX*S
Dynamic Range	79dB linear mode
SNR	39dB
Operation Temperature	-30°C to +85°C
Best IQ Temperature	-20°C to +60°C
Power Supply	Analog = 2.8 V
	Digital = 1.2V
Package	I/O = 1.8V
	41-pin CSP
Package Size	6.45mm x 4.26mm



产品特性 | Features

- 宽画幅16:9比例, 可实现1620P, 3K 视频输出

Display Friendly 16:9 for 1620P, 3K Video Output

- 850/940nm 近红外增益

850/940 nm Near IR Improvement

- 低功耗

Low Power Consumption

应用场景 | Applications

- AI安防摄像头

AI Security Cameras

- 工业安防摄像头

Industrial Security Cameras

- 视频会议摄像头

Video Conference Cameras



WeChat



LinkedIn

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Bantian Street, Longgang District, ShenZhen
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4340 Stevens Creek Blvd, Suite 280, San Jose CA95129
Tel: +1 408 981 6626



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



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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
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	

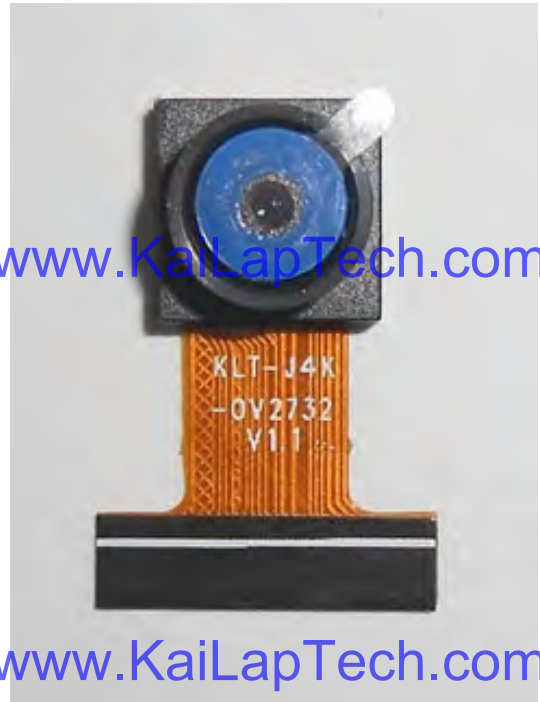


KLT Package Solutions

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**





CMOS CAMERA MODULES



your BEST camera module partner

Large Order Package Solution

Place Foam Sheets Between Trays

Foam Sheets are Slightly Larger than Trays



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Place Foam Sheets and Trays into Box

Foam Sheets are Tightly Fitting Box



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Small Order Package Solution

Place Foam Sheets and Trays into Small Box



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Package in Small Box for Shipment

Foam Sheets are Nicely Fitting the Small Box



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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.

www.KaiLapTech.com

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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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