

**KLT-5067-IMX686 V1.0****64MP Sony IMX686 MIPI Interface Auto Focus Camera Module**

Front View



Back View

Specifications

Camera Module No.	KLT-5067-IMX686 V1.0
Resolution	64MP
Image Sensor	IMX686
Sensor Type	1/1.73"
Pixel Size	0.8 um x 0.8 um
EFL	5.43 mm
F.NO	1.89
Pixel	9284 x 6944
View Angle	79.8°(DFOV)
Lens Dimensions	11.80 x 11.30 x 6.95 mm
Module Size	18.05 x 11.80 mm
Module Type	Auto Focus
Interface	MIPI
Auto Focus VCM Driver IC	DW9800V
Lens Type	650nm IR Cut
Operating Temperature	-20°C to +85°C
Mating Connector	OK-118RF030-35

**KLT-5067-IMX686 V1.0****64MP Sony IMX686 MIPI Interface Auto Focus Camera Module**

Top View



Side View



Bottom View

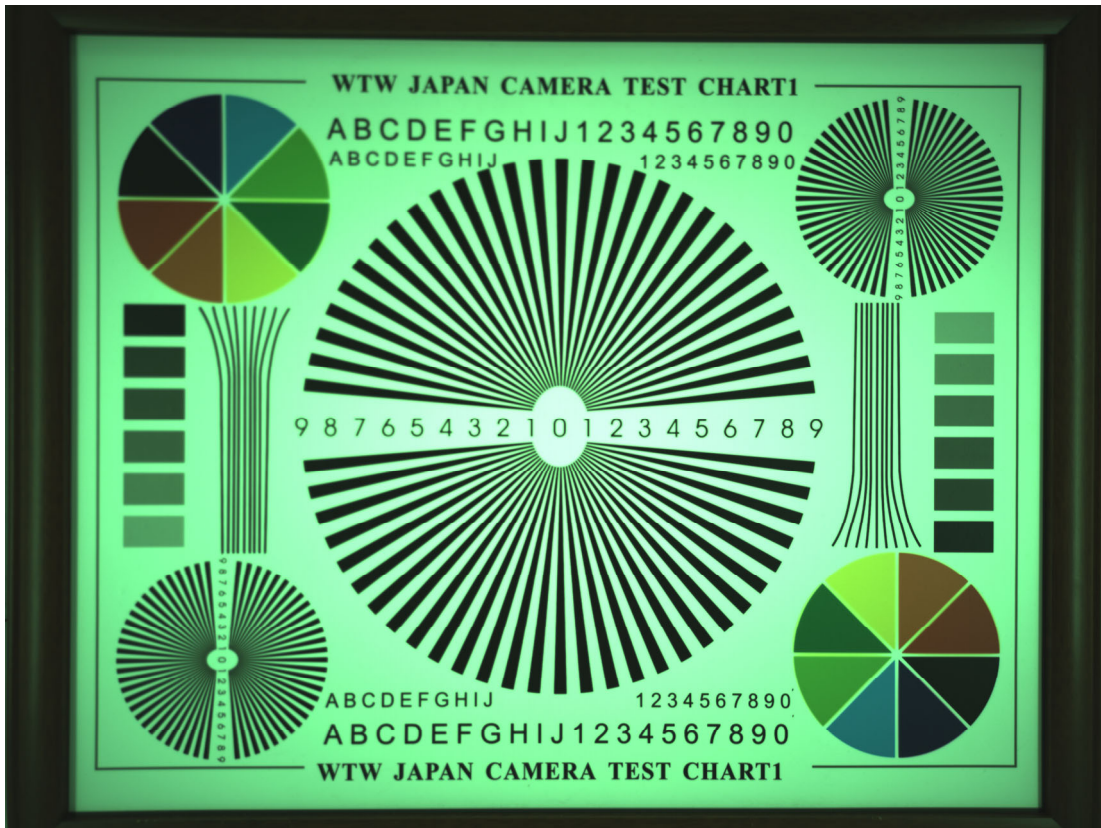
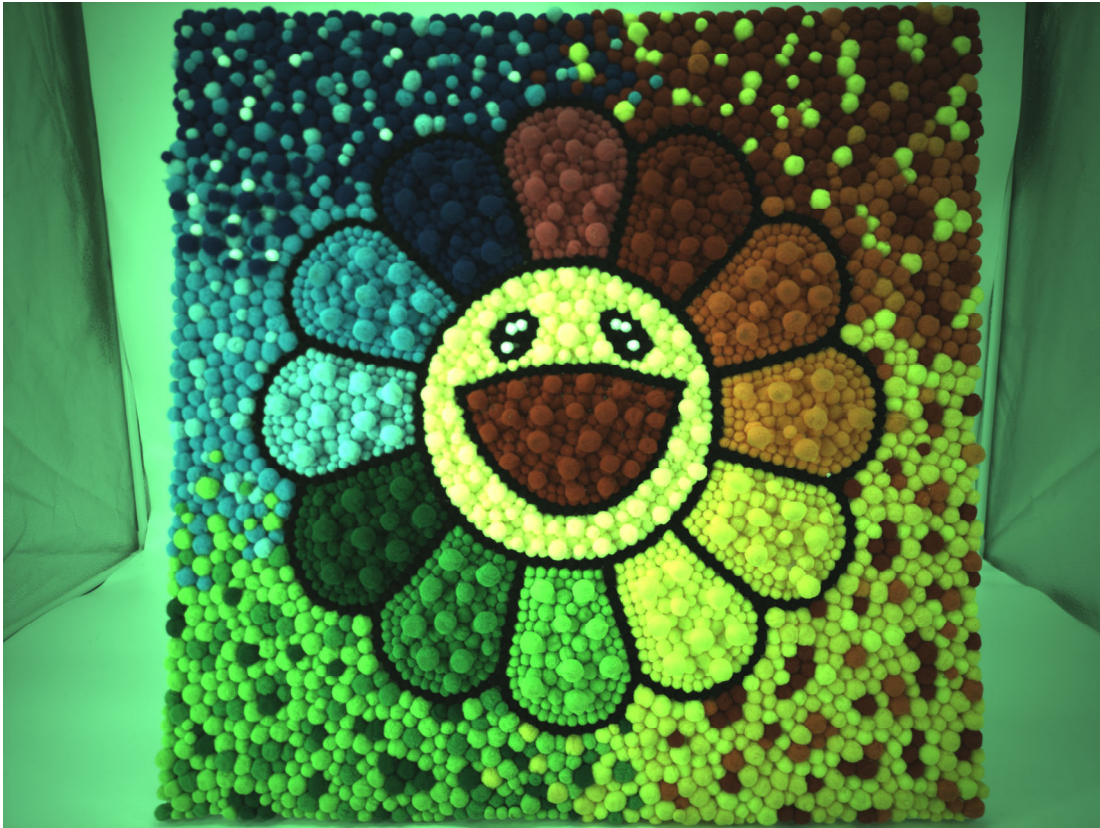


Mating Connector



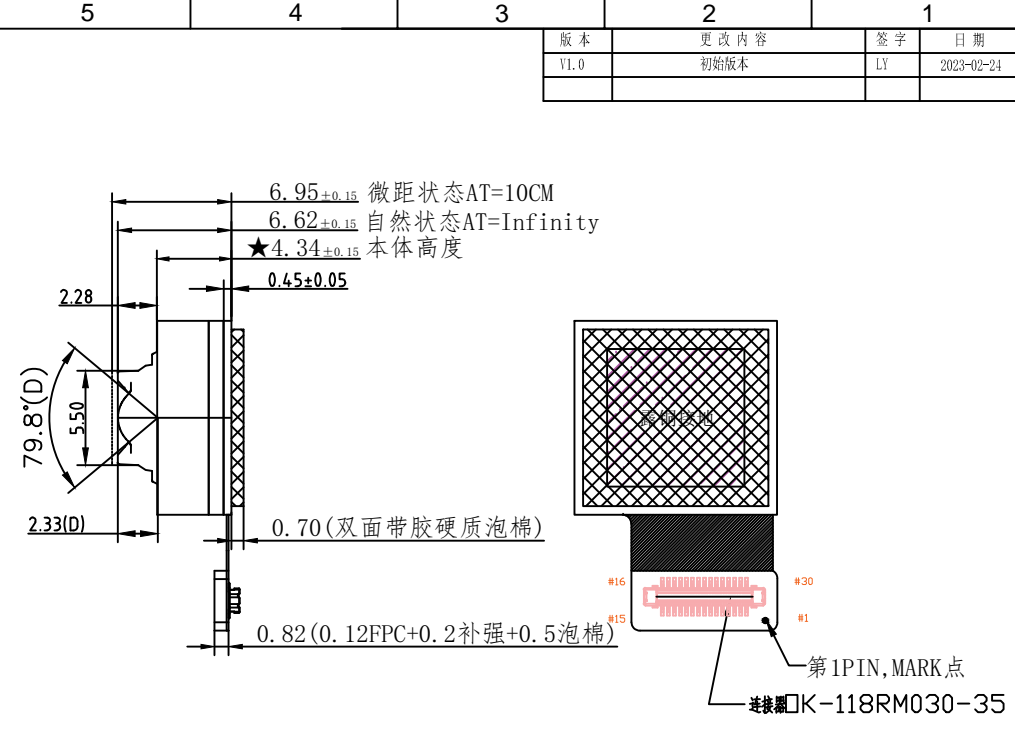
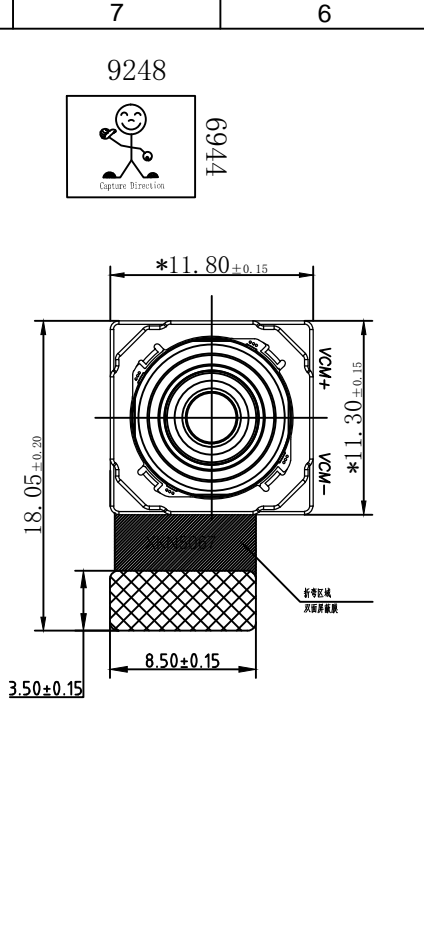
your BEST camera module partner





Project Design Drawing RoHs2.0+HF

Pin Assignment	
1	NC
2	MCAM_CLK_P
3	MCAM_CLK_N
4	GND
5	MCAM_DATA2_P
6	MCAM_DATA2_N
7	GND
8	MCAM_DATA0_P
9	MCAM_DATA0_N
10	GND
11	MCAM_DATA3_P
12	MCAM_DATA3_N
13	GND
14	MCAM_DATA1_P
15	MCAM_DATA1_N
16	NC
17	MCAM_PDN
18	MCAM_RST
19	MCAM_SDA
20	MCAM_SCL
21	GND
22	MCAM_CLK
23	GND
24	AFVDD_M_2.8V
25	GND
26	DVDD_F_1.05V
27	NC
28	VCAMIO_1.8V
29	GND
30	AVDD_F_2.8V



- NOTE:
- 1、带*标志的为重点尺寸, CPK≥1.33;
 - 2、FPC使用无胶压延铜基材, 弯折区注意覆盖膜工艺处理和柔化处理;
 - 3、FPC弯折区域满足180度折弯30次不失效 (弯折半径R=0.8mm)
 - 4、模组处于不工作状态时, 建议关闭模组全部电源
 - 5、MIPI差分阻抗: 100±10欧姆;

版本	更改内容	签字	日期
V1.0	初始版本	LY	2023-02-24

CUSTOMER APPROVED CHECKED

主要参数 (Module Specification)			
镜头类型	6P	感光芯片型号	IMX686
景深	10cm~∞F	芯片厂商	SONY
畸变 (Distortion)	<1.5%	像素	9248*6944
焦距 (EFL)	5.43mm	芯片尺寸	1/1.7 Inch
光圈 (F NO.)	1.89±5%	芯片IC地址 (Sensor I/O)	0x20 (W)/0x21 (R)
视场角 (FOV)	79.8° ±3°	马达电压 (AF-VCC)	2.8V
对焦距离	10m	马达额定电流	/
IR类型 (IR/BG)	BG	Reset控制 (高/低有效)	/
量产解像力 (TV-Line)	/	EEprom 型号	BL24SA64D

公差范围	
~5	±0.08
5~10	±0.1
10~50	±0.15
50~100	±0.2
100~	±0.2

名称	KLT-5067-IMX686 V1.0		客户名称	-	
设计	LY	日期	2023-02-24	图号	20230200011
审核	LXP	日期	2023-02-24	比例	/
批准				图例	⊕ □

Kai Lap Technologies Group Ltd

8 7 6 5 4 3 2 1

Diagonal 9.251 mm (Type 1/1.73) 64Mega-Pixel CMOS Image Sensor with Square Pixel for Color Cameras

IMX686-AAJH5-C

General description and application

IMX686 is a diagonal 9.251 mm (Type 1/1.73) 64 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 four power supply voltages: analog 2.9 V and 1.8V, digital 1.1 V 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.

Functions and Features

- ◆ Back-illuminated and stacked CMOS image sensor
- ◆ Quad Bayer Coding (QBC) color filter arrangement
- ◆ Phase Detection Auto Focus (PDAF)
- ◆ High Frame Rate
 - 27fps@Full resolution (QBC Re-mosaic)
 - 30fps@QBC-HDR
 - 30fps@V2H2 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 (DPC)
- ◆ Lens Shading Correction (LSC)
- ◆ Built-in temperature sensor
- ◆ Output video format of RAW10, RAW8, RAW14(QBC HDR without Local Tone Mapping)
- ◆ 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 4.5Gbps/Trio, C-PHY spec. ver. 1.2 compliant
- ◆ 2-wire serial communication (Supports I²C "Fast mode", "Fast-mode Plus" and I3C)
- ◆ 5K bit of OTP ROM for users

This information does not convey any license by any implication or otherwise under any patents or other right.

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 9.251 mm (Type 1/1.73)
◆ Number of effective pixels	: 9344 (H) × 7024 (V) approx. 65.6 M pixels
◆ Number of active pixels	: 9248 (H) × 6944 (V) approx. 64.2 M pixels
◆ Chip size	: 8.638 mm (H) × 6.460 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 (digital)	VDIG	-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 +85	°C	Tj
Guaranteed storage temperature	TSTG	-30 to +85	°C	Tj
Guaranteed performance temperature	TSPEC	0 to +60	°C	Tj

Recommended Operating Voltage

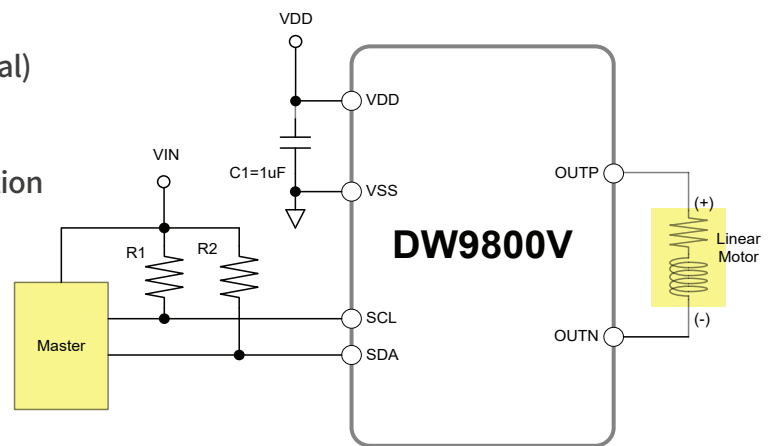
Item	Symbol	Ratings	Unit	notes
Supply voltage (analog1)	VANA1	2.9 ± 0.1	V	refer to VSS level
Supply voltage (analog2)	VANA2	1.8 ± 0.1	V	
Supply voltage (digital)	VDIG	1.1 ± 0.1	V	
Supply voltage (interface)	VIF	1.8 ± 0.1	V	

DW9800V: Bi-Directional VCM Driver IC

Features

- Power Supply voltage (VDD) : 2.3V to 4.8V
- Typical $\pm 100\text{mA}$ output driving ($\pm 130\text{mA}$ optional)
- 1.8V Serial Interface (I2C Compatible)
- I2C Slave address change support by Factory Option
- Thermal Shutdown Function
- SAC™ (Smart Actuator Control) mode for Faster and accurate ringing control performance

Typical Application

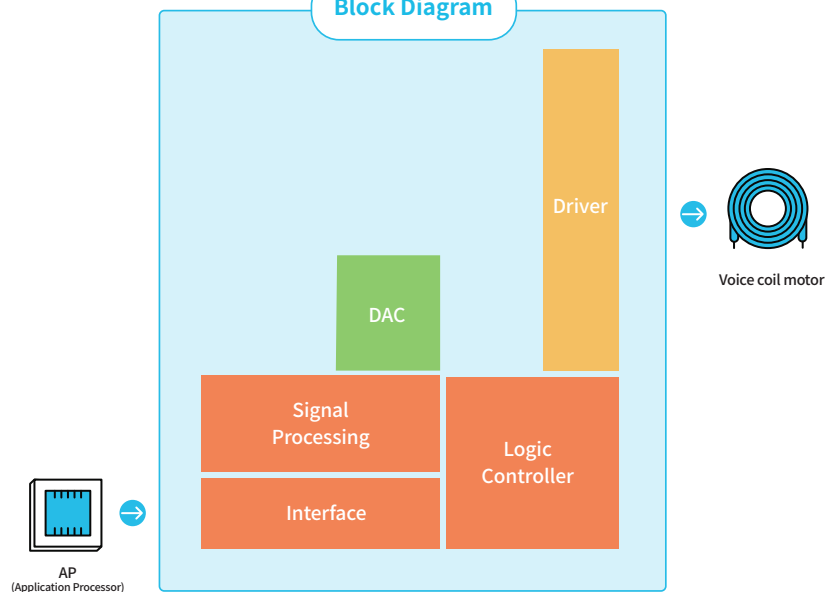


1) : The SAC™ (Smart Actuator Control) is registered trademark and DONGWOON ANATECH's own knowhow and patents.

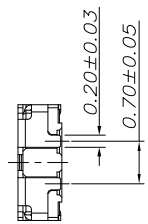
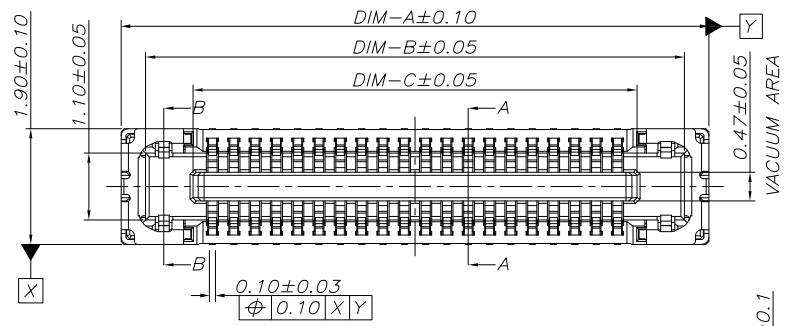
Applications

- Lens autofocus
- Optical zoom & shutters
- Camera phones
- Camera modules
- Digital still cameras
- Web/PC cameras

Block Diagram

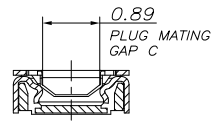
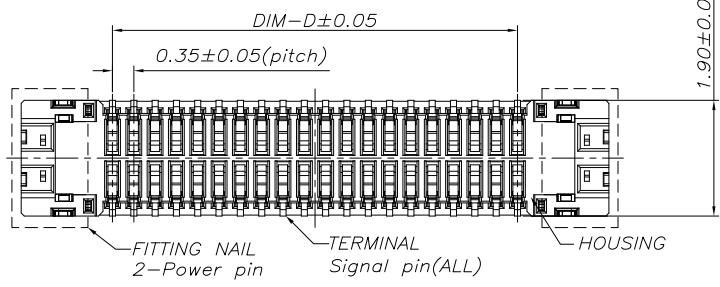
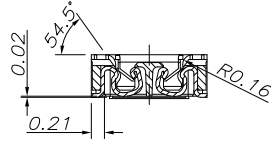
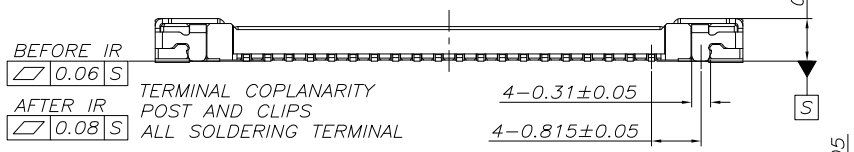


REV.	ECN NO.	DESCRIPTION	DRA	DATE

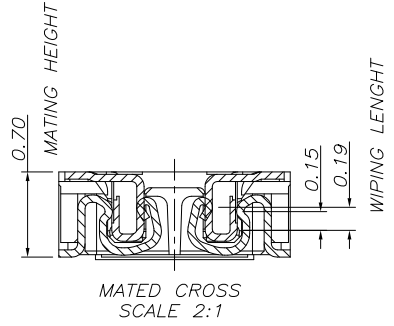
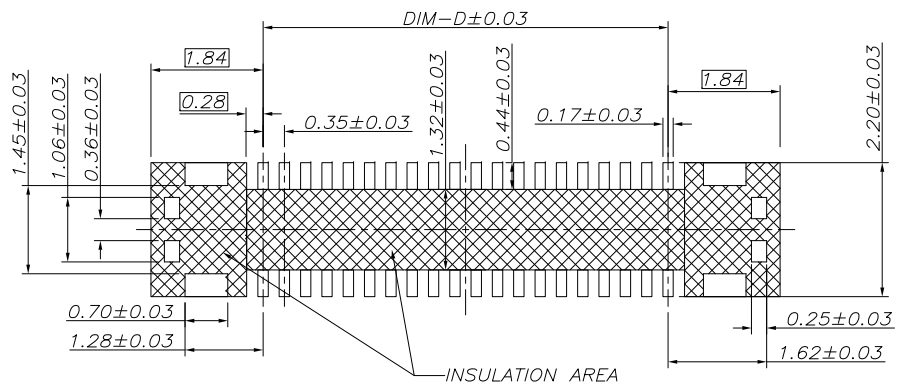
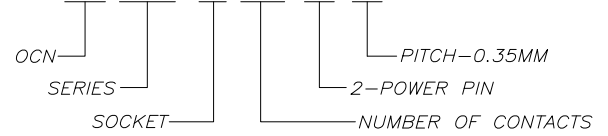


SPECIFICATIONS:

- 1) MATERIAL:
 - 1-1. MOLDED PORTION: LCP SV6808THF B(UL94 V-0)
 - 1-2. CONTACT AND POST: COPPER ALLOY
- 2) SURFACE TREATMENT:
 - TERMINAL PORTION: BASE: NICKEL PLATING OVERALL;
 - GOLD PLATING CONTACT AREA MIN;
 - SOLDER AREA MIN
- 3) CHARACTERISTICS:
 - 3-1. RATED VOLTAGE: 50V AC/DC
 - 3-2. RATED CURRENT: POWER PIN 3A/CONTACT;
SIGNAL PIN 0.3A/CONTACT (MAX. 5A AT TOTAL CONTACT)
 - 3-3. INSULATION RESISTANCE: MIN. 1000MΩ (INITIAL)
 - 3-4. BREAKDOWN VOLTAGE: 250V AC FOR 1 MIN.
 - 3-5. SALTWATER SPRAY RESISTANCE (HEADER AND SOCKET MATED):
48 HOURS, INSULATION RESISTANCE MIN. 1000MΩ,
CONTACT RESISTANCE Δ20mΩ
 - 3-6. CONTACT RESISTANCE: POWER PIN 20mΩ MAX;
SIGNAL PIN 50mΩ MAX
 - 3-7. AMBIENT TEMPERATURE: -55°C - +85°C
 - 3-8. STORAGE TEMPERATURE: -55°C - +85°C (PRODUCT ONLY);
-40°C - +50°C (EMBOSS PACKING)
 - 3-9. WARRANTY PERIOD: 12 MONTH
 - 3-10. COMPOSITE INSERTION FORCE: $1.5N \cdot (n+4)$ MAX (40N MAX TOTAL)
n=NUMBER OF CONTACTS
 - 3-11. COMPOSITE REMOVAL FORCE: 0.15N/PIN MIN.
 - 3-12. DURABILITY: 30 TIMES



OK-118 RF*/2-35**



ONLY FOR ORBEC

NUMBER OF CONTACTS	DIM-A	DIM-B	DIM-C	DIM-D
10	4.40	3.60	2.04	1.40
24	6.85	6.05	4.49	3.85
30	7.90	7.10	5.54	4.90
34	8.60	7.80	6.24	5.60
38	9.30	8.50	6.94	6.30
40	9.65	8.85	7.29	6.65
50	11.40	10.60	9.04	8.40

RECOMMENDED PCB LAYOUT



DIMENTION IN mm		 奇奇 科技 OCN TECHNOLOGY
TOLERANCE UNLESS OTHERWISE SPECIFIED		
DIMENTION	ANGLES	APPD: TITLE: 0.35MM BTB 0.7H CONNECTORS SOCKET CHKD: DWG NO: OK-118RF***/2-35 DRA:
$.0 \pm 0.20$ $.0 \pm 0.10$ $.00 \pm 0.05$ $.000 \pm 0.01$	$. \pm 2^\circ$ $.0 \pm 1^\circ$ $.00 \pm 0.5^\circ$ $.000 \pm 0.3^\circ$	PROJ SIZE SHEET SCALE REV. A4 1/2 1:1 A0



your BEST camera module partner

Cameras Applications



Automotive Driver Pilot



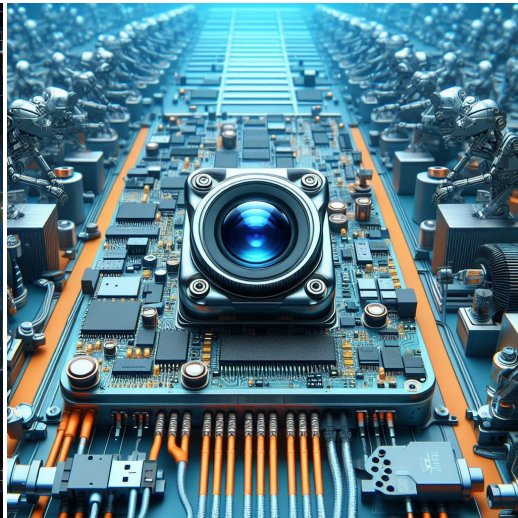
Live Streaming



Video Conference



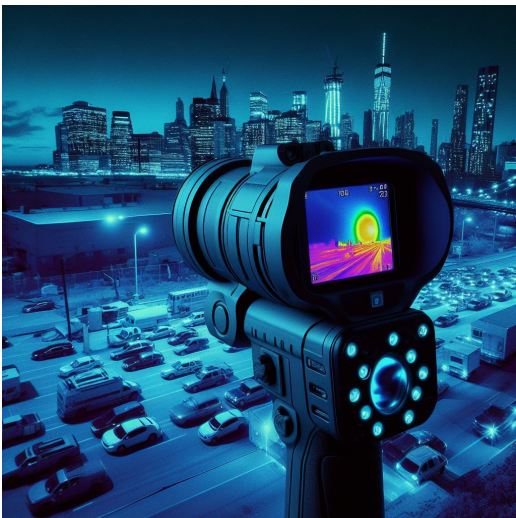
Eye Tracker Biometric Detection



Machine Vision



Agricultural Monitor



Night Vision Security



Drone and Sports Eagle Eyes



Interactive Pet Camera

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

All rights reserved @ Kai Lap Technologies Group Ltd. Specifications subject to change without notice.



your **BEST** camera module partner

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



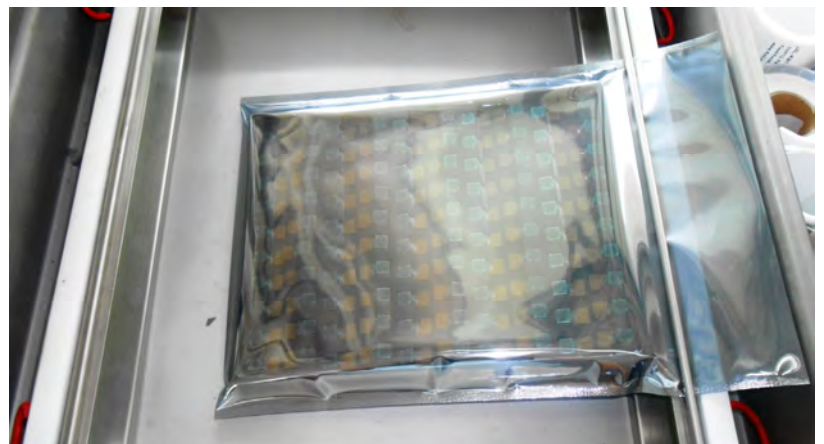
Cover Tray with Lid



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





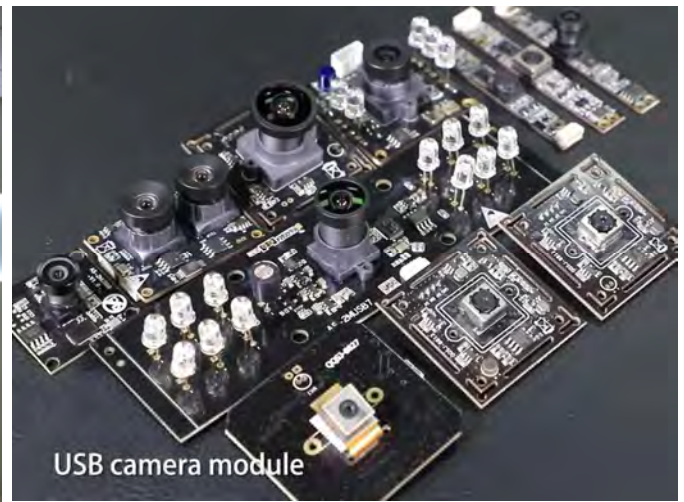
your BEST camera module partner

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



your BEST camera module partner

KLT Strength

Powerful Factory



Professional Service



Promised Delivery



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

All rights reserved @ Kai Lap Technologies Group Ltd. Specifications subject to change without notice.