

KLT-E3MPF-OV9281 V1.0 NIR

**1MP OmniVision OV9281 Global Shutter MIPI and DVP Parallel Interface
No IR Filter Fixed Focus Camera Module**



Front View



Back View

Specifications

| | |
|---------------------------------|-------------------------------------|
| Camera Module No. | KLT-E3MPF-OV9281 V1.0 NIR |
| Resolution | 1MP |
| Image Sensor | OV9281 Global Shutter |
| Sensor Type | 1/4" |
| Pixel Size | 3.0 um x 3.0 um |
| EFL | 3.20 mm |
| F.NO | 2.80 |
| Pixel | 1296 x 816 |
| View Angle | 70.0°(DFOV) 58.6°(HFOV) 45.3°(VFOV) |
| Lens Dimensions | 8.50 x 8.50 x 4.75 mm |
| Module Size | 24.00 x 8.50 mm |
| Module Type | Fixed Focus |
| Interface | MIPI and DVP Parallel |
| Auto Focus VCM Driver IC | None |
| Lens Model | KLT-LENS-M5182 |
| Lens Type | No IR Filter Lens |
| Operating Temperature | -30°C to +85°C |
| Mating Connector | DF30FC-24DS-0.4V |

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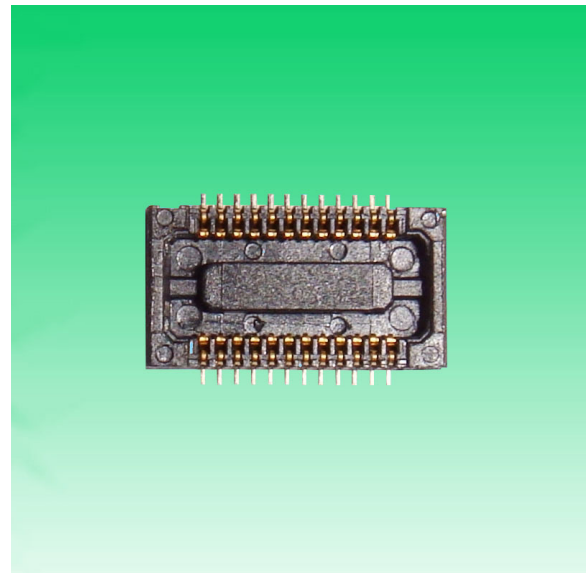
Top View



Side View



Bottom View

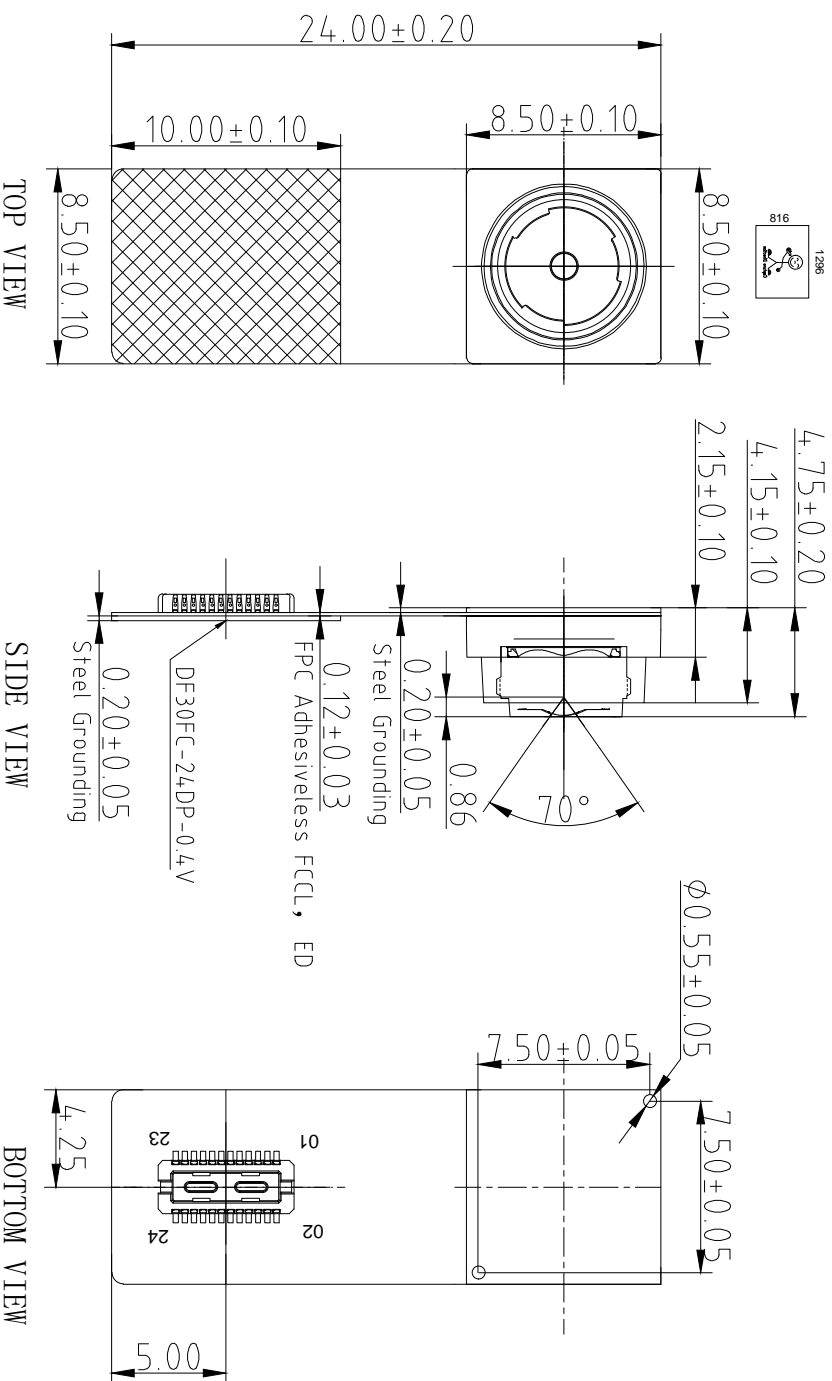


Mating Connector

ROHS

| PIN | NAME |
|-----|-------------|
| 1 | FSIN/VSYN/C |
| 2 | AVDD2.8V |
| 3 | SCL |
| 4 | SDA |
| 5 | RESET |
| 6 | NC |
| 7 | D0VDD1.8V |
| 8 | DVDD1.2V |
| 9 | STROBE |
| 10 | XCLK |
| 11 | PCLK |
| 12 | HREF |
| 13 | MDP0/D2 |
| 14 | MCP/D4 |
| 15 | MDN0/D3 |
| 16 | MCN/D5 |
| 17 | DGND |
| 18 | SID |
| 19 | DGND |
| 20 | MDP1/D6 |
| 21 | DGND |
| 22 | MDN1/D7 |
| 23 | D8 |
| 24 | D9 |

| Version Mark | Information | Date |
|--------------|------------------|------------|
| V1.0 | PD First Version | 05-06-2019 |



Parameters:

1、Sensor specification:

Image Sensor: OV9281
 Pixel: $3\mu\text{m} \times 3\mu\text{m}$
 Lens Type: 1/4
 Important Voltage Description: DVDD1.2V
 (external power supply);

2、Lens specification:

Fov: 70°
 F/NO.: 2.8
 TV distortion: $<10\%$
 Focal length: 3.2mm
 Composition: 4P

Kai Lap Technologies Group Ltd

| | | | | |
|-------------|-----------|------------------|---------------------------|-----------------|
| Designed By | Kevin | Model Name: | KLT-E3MPF-0V9281 V1.0 NIR | |
| Checked By | Aouly yan | Projection Type: | Unit: mm | Material: ----- |
| | | Third Angle | Scale: 1:1 | Sheet: 1 of 1 |
| | | | | Version: 1/0 |



Lens Model: KLT-LENS-M5182

| SPECIFICATION | | |
|---------------------------------------|---------------|------------------|
| 1. SENSOR SIZE | 1/4" (9M COB) | |
| 2. MAX IMAGE CIRCLE | φ4.85mm | |
| 3. TOTAL TRACK | 4.0±0.1mm | |
| 4. EFL | 3.2mm | |
| 5. OPTICAL EFL | 1.32mm | |
| 6. MECHANICAL EFL | 0.96mm | |
| 7. F.NO | 2.8±0.05 | |
| 8. VIEW FIELD | VERTICAL | 45.3° (Y=L.3E) |
| | HORIZONTAL | 58.9° (Y=L.81) |
| | DIAGONAL | 70.9° (Y=L.2.2E) |
| 9. OPTICAL DISTORTION | <1.0% | |
| 10. TV DISTORTION | <1.0% | |
| 11. RELATIVE ILLUMINATION | >42.2% | |
| 12. CONSTRUCTION | 4P | |
| 13. CHIEF RAY ANGLE | <25° | |
| 14. CUT FREQUENCY AT 50% | ✓ | |
| 15. THREAD | M3.0X0.35P | |
| 16. IMAGE QUALITY | AXIS | 39.0μm/mm |
| | 0.7Y | 200μm/mm |
| 17. APPEARANCE QUALITY (Scratch/Dial) | CENTER | 20/10 |
| | EDGE | 40/20 |

NOTE:

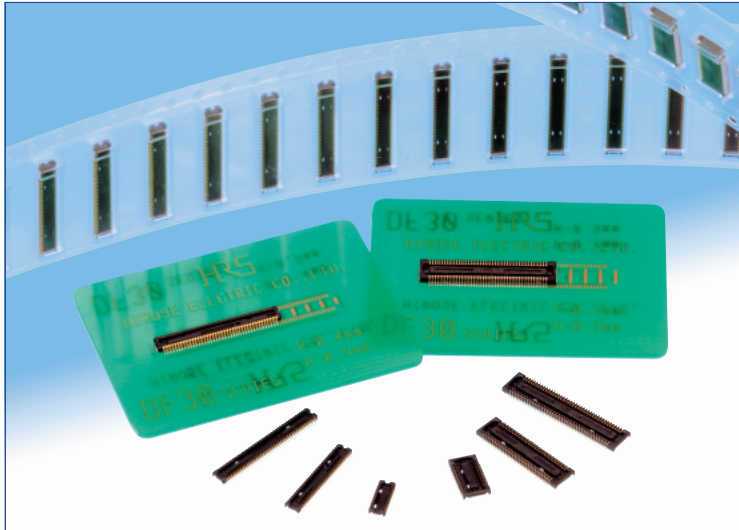
1. 镜头表面不可有油污、灰尘、毛丝等异物。
2. 镜头配VCM纵附高度为 4.2±0.1mm, 扭力为20--120gf.cm.
3. 镜头承受推力为≥2.0kg.
4. 镜头组品质参数需符合图中要求。

| NO | MODIFY CONTENT | NAME | DATE | ANGLE | DIN | INT | MATERIAL | SCALE | DESIGNED BY | CHECKED BY | DATE | REVISION |
|----|------------------------------|--------|------------|-------------------------|-------------------------|-----|----------|--------|-------------|------------|------|----------|
| 1 | 增加9848A35G/0098X35301(0-d1c) | tomlin | 2016-12-05 | X, XXX X, XX X, X | ±0.5° ±0.010 ±0.1 | | | 10 : 1 | | | | |

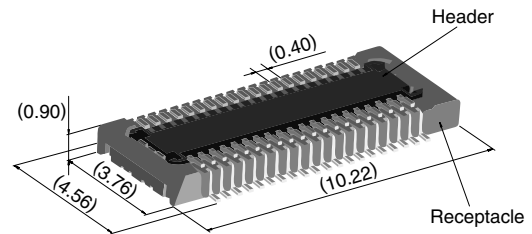
| WORKER | NAME | DATE | REV. |
|--------|--------|------------|------|
| A4 | tomlin | 2016-12-05 | A-01 |

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.

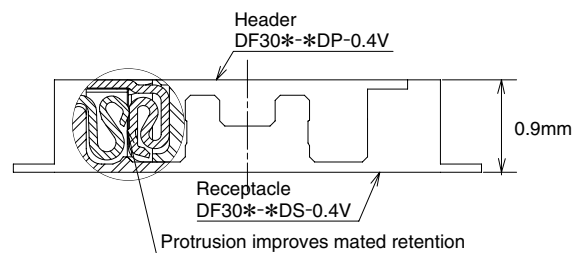
Applications

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

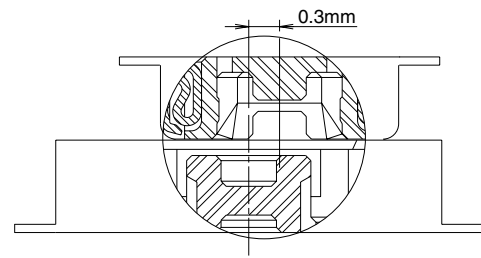
Low profile

Increased mated retention

High contact reliability



Self alignment



Product Specifications

| | | | |
|--------|----------------------|---|--|
| Rating | Rated current 0.3A | Operating temperature range : -35°C to 85°C (Note 1) | Storage temperature range -10°C to 60°C (Note 2) |
| | Rated voltage 30V AC | Operating humidity range : Relative humidity 20% to 80% | Storage humidity range Relative humidity 40% to 70% (Note 2) |

| 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 | ———— |

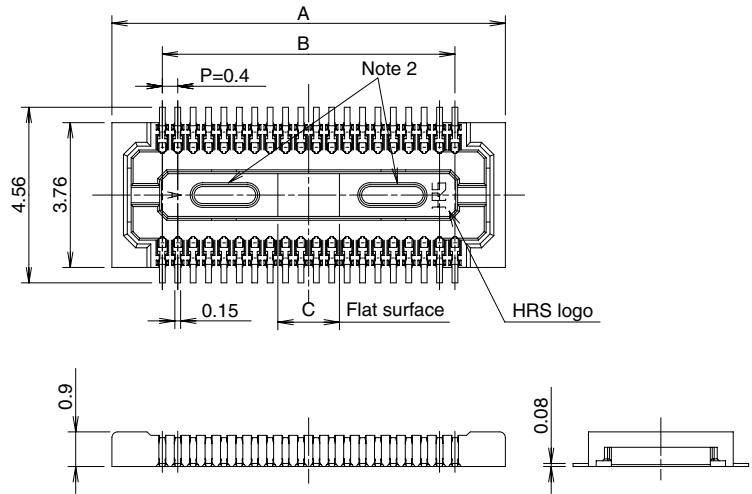
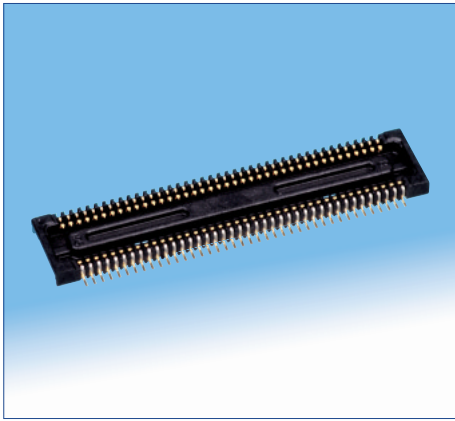
Ordering information

Receptacles and Headers

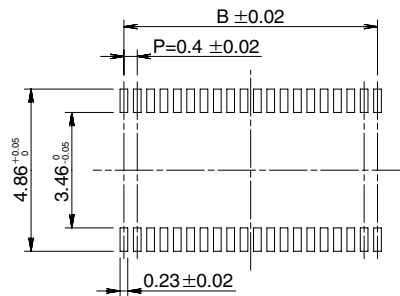
DF30 **FC** - ***** **DS - 0.4** **V** **(**)**
1 2 3 4 5 6 7

| | |
|---|--|
| 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 μm

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

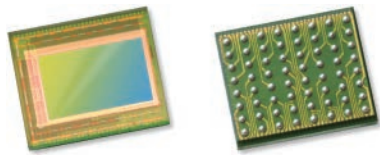
* Tolerances non- accumulative.

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.



OV9281-OV9282 1-megapixel product brief



1-Megapixel OmniPixel®3-GS Sensors for Computer Vision Applications



available in a lead-free package

OmniVision's OV9281 and OV9282 are high-speed global shutter image sensors that bring 1-megapixel resolution to a wide range of consumer and industrial computer vision applications, including augmented reality (AR), virtual reality (VR), collision avoidance in drones, bar code scanning and factory automation. Built on OmniVision's OmniPixel®3-GS pixel technology, the OV9281 and OV9282 feature a high-speed global shutter pixel with best-in-class near-infrared (NIR) quantum efficiency (QE) to meet high-resolution and low-latency requirements.

Special features of the OV9281 and OV9282 include region of interest (ROI) selection and context switching. This allows some of the camera settings to change dynamically as fast as alternating frames. The sensors are available in both narrow and wide chief ray angle (CRA) settings.

The 1/4-inch OV9281 and OV9282 capture 1280 x 800 resolution images at 120 frames per second (fps) and VGA resolution at 180 fps with 2-lane MIPI and DVP output. The OV9281 and OV9282 also feature support for frame synchronization and dynamic defective pixel correction.

The OV9281 has a chief ray angle (CRA) of 9 degrees and comes in a chip scale package (CSP). The OV9282 features a CRA of 27 degrees and is available in a reconstructed wafer (RW) format. Both sensors are currently available in volume production.

Find out more at www.ovt.com.



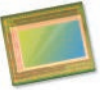
Applications

- Consumer HMD
- Drones
- Machine Vision
- PCNB

Product Features

- 3 μm x 3 μm pixel with OmniPixel³-GS technology
- automatic black level calibration (ABLC)
- programmable controls for:
 - frame rate
 - mirror and flip
 - cropping
 - windowing
- support output formats: 8/10-bit RAW
- fast mode switching
- supports 2x2 monochrome binning
- two-lane MIPI serial output interface
- DVP parallel output interface
- supports horizontal and vertical 2:1 and 4:1 monochrome subsampling
- support for image sizes:
 - 1280 x 800
 - 1280 x 720
 - 640 x 480
 - 640 x 400
- embedded 256 bits of one-time programmable (OTP) memory for part identification
- two on-chip phase lock loops (PLLs)
- LED PWM
- built-in strobe control

OV9281-OV9282



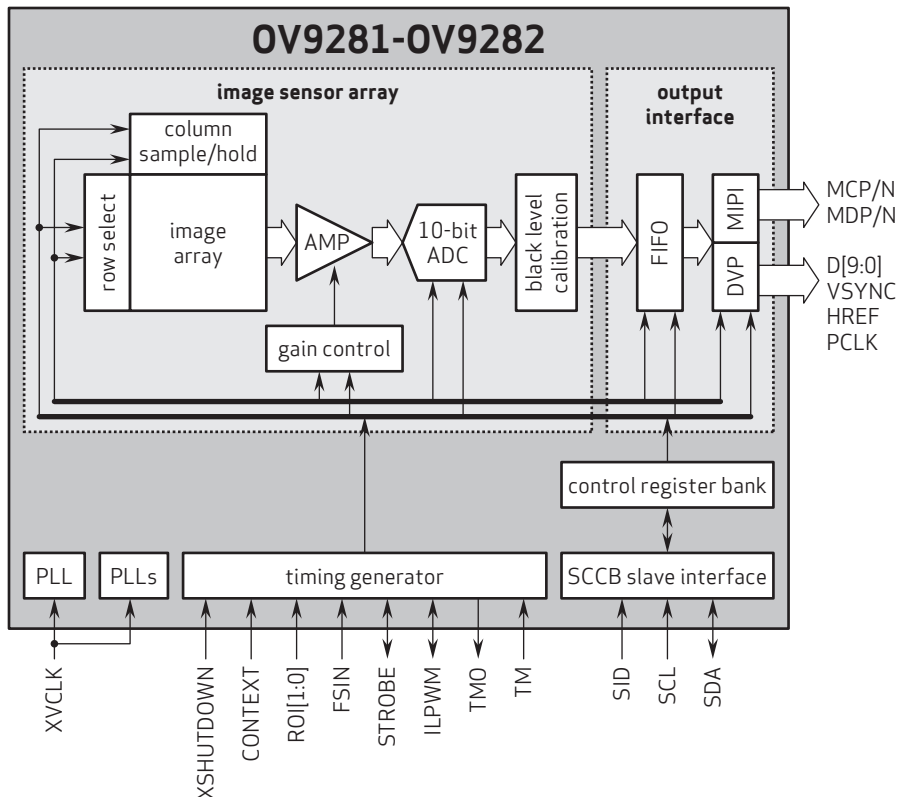
Ordering Information

- **OV9281-H64A**
(b&w, lead-free) 64-pin CSP
- **OV9282-GA4A**
(b&w, lead-free, 200 μm backgrinding, reconstructed wafer with good die)

Technical Specifications

- **active array size:** 1296 x 816
- **maximum image transfer rate:**
- 1280 x 800: 120 fps
- **power supply:**
 - analog: 2.8V (nominal)
 - core: 1.2V (nominal)
 - I/O: 1.8V (nominal)
- **power requirements:**
 - active: 156 mW
 - standby: 150 μA
 - XSHUTDOWN: 150 μA
- **temperature range:**
 - operating: -30°C to +85°C junction temperature
 - stable image: 0°C to +50°C junction temperature
- **output interfaces:** 2-lane MIPI serial output and DVP parallel output
- **output formats:** 8/10-bit RAW
- **lens size:** 1/4"
- **lens chief ray angle:**
 - OV9281: 9° linear
 - OV9282: 26.78° non-linear
- **scan mode:** progressive
- **pixel size:** 3 μm x 3 μm
- **image area:** 3896 μm x 2453 μm

Functional Block Diagram



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OmniVision



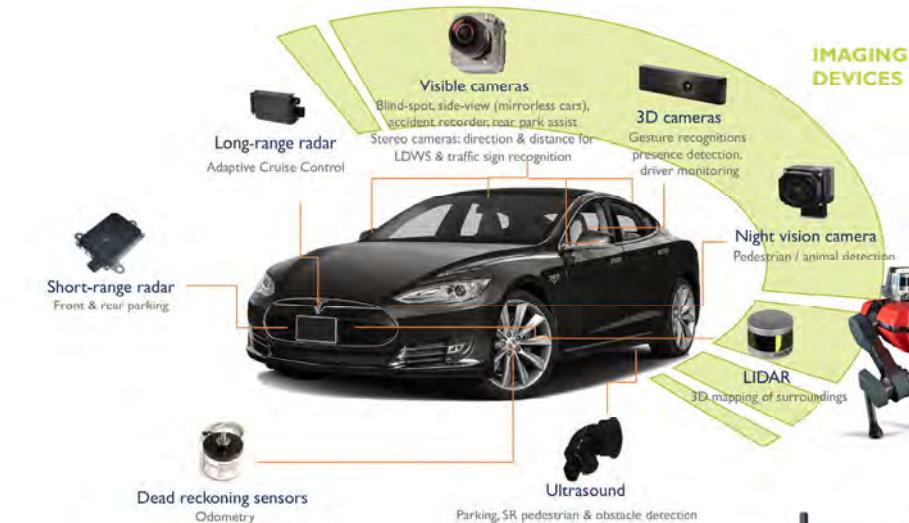
Camera Module Pinout Definition Reference Chart

| 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 | | | | | | | | | |
| MIPI Interface | | | | | | | | | |
| 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 | | | | | |
| DVP Parallel Interface | | | | | | | | | |
| 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 | | | | | | | |



your **BEST** camera module partner

Cameras Applications





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 |



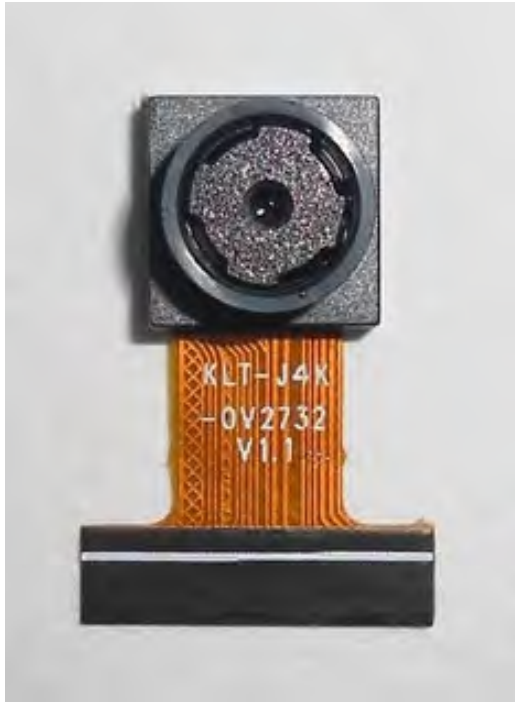


| Inspection Item | | Inspection Method | Standard of Inspection | | |
|------------------|----------|-------------------|-----------------------------|--|---------------------------------|
| Category | Item | | | | |
| Appearance | FPC/ PCB | Color | The Naked Eye | Major Difference is Not Allowed. | |
| | | 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



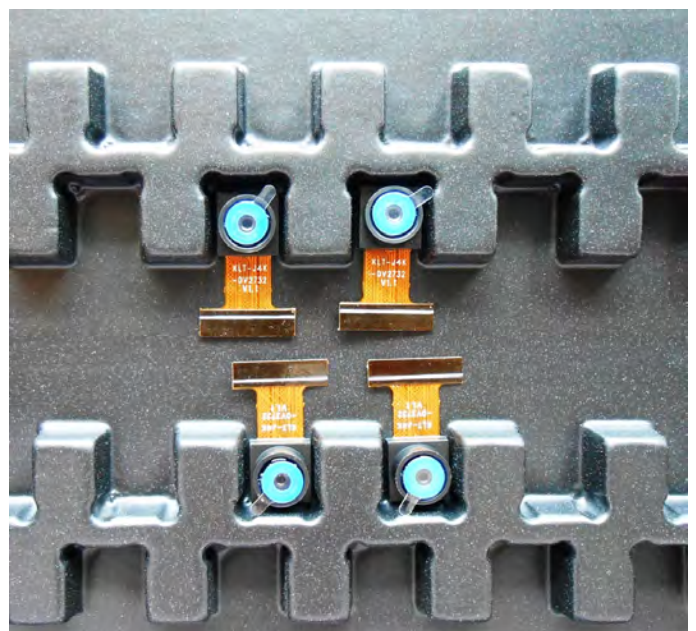
Complete with Lens Protection Film



Tray with Grid and Space



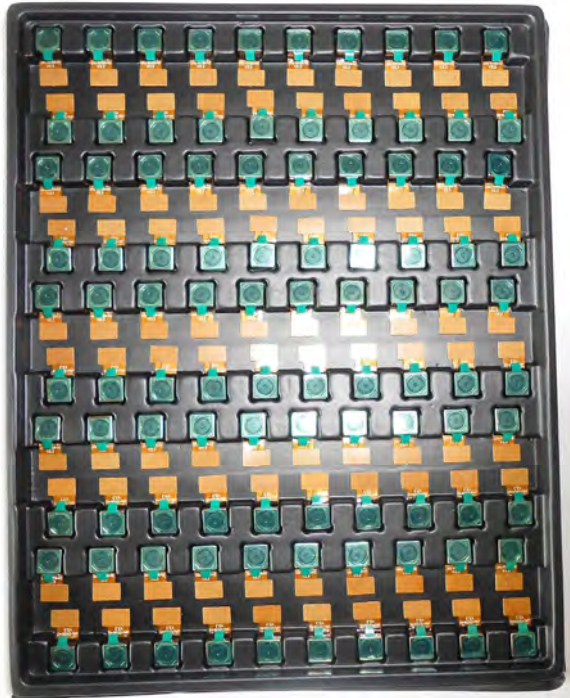
Place Cameras on the Tray





Camera Modules Package Solution

Full Tray of Cameras



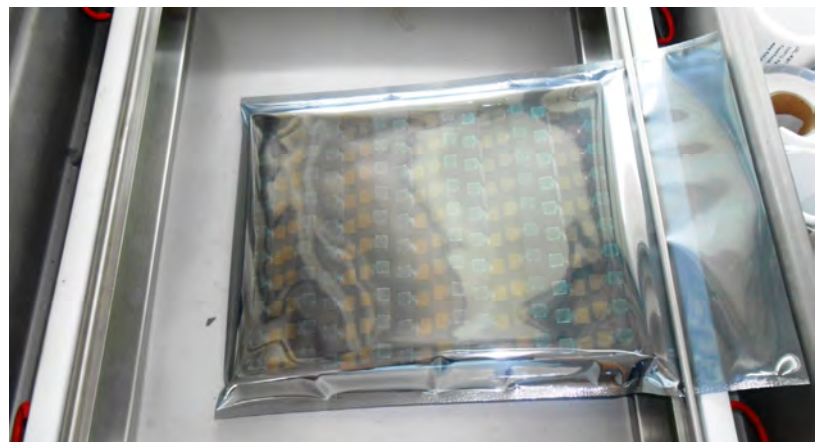
Cover Tray with Lid



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





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





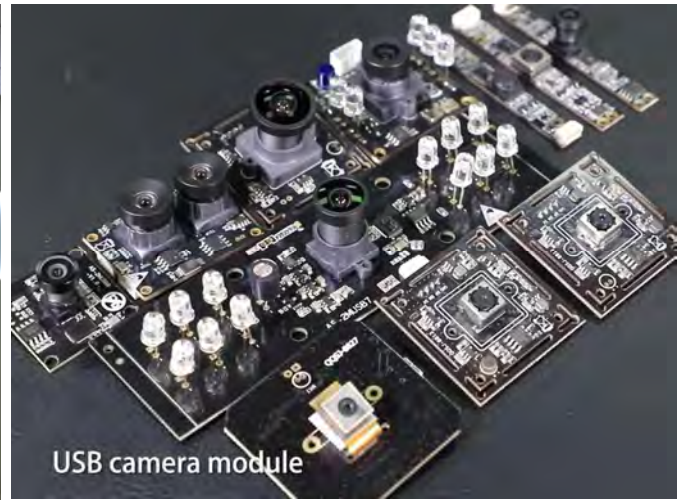
your BEST camera module partner

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



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KLT Strength

Powerful Factory



Professional Service



Promised Delivery



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