

KLT-T4K-OV13850 V2.0

13MP OmniVision OV13850 MIPI Interface Auto Focus Camera Module



Front View



Back View

Specifications

| | |
|--------------------------|-------------------------------------|
| Camera Module No. | KLT-T4K-OV13850 V2.0 |
| Resolution | 13MP |
| Image Sensor | OV13850 |
| Sensor Type | 1/3.06" |
| Pixel Size | 1.12 um x 1.12 um |
| EFL | 3.81 mm |
| F.NO | 2.20 |
| Pixel | 4224 x 3136 |
| View Angle | 74.4°(DFOV) 62.7°(HFOV) 48.7°(VFOV) |
| Lens Dimensions | 8.50 x 8.50 x 5.60 mm |
| Module Size | 163.00 x 8.50 mm |
| Module Type | Auto Focus |
| Interface | MIPI |
| Auto Focus VCM Driver IC | DW9714P |
| Lens Model | KLT-LENS-50013A1 |
| Lens Type | 650nm IR Cut |
| Operating Temperature | -30°C to +85°C |
| Mating Connector | AXE530124 |



KLT-T4K-OV13850 V2.0

13MP OmniVision OV13850 MIPI Interface Auto Focus Camera Module



Top View



Side View

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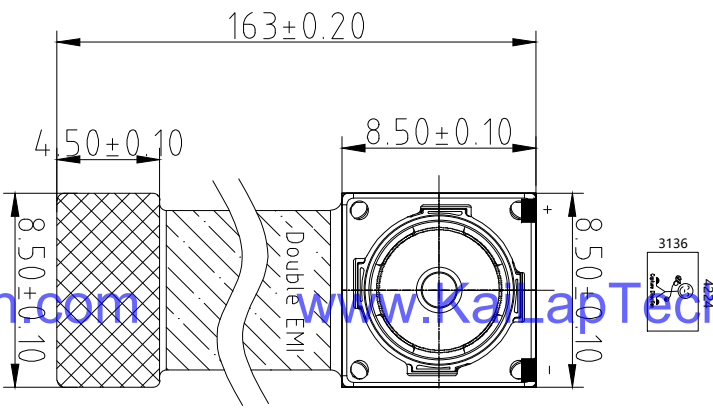
Bottom View



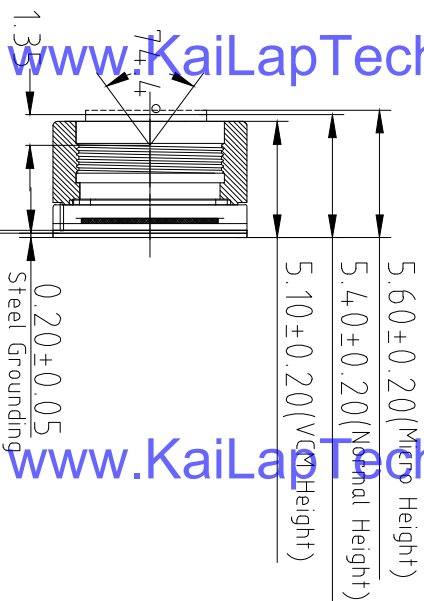
Mating Connector

RoHS

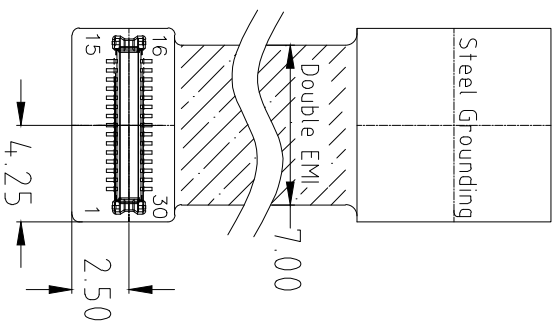
| | |
|----|------------|
| 1 | FREX |
| 2 | VSYNC |
| 3 | SDA |
| 4 | AFVDD 2.8V |
| 5 | DOVDD 1.8V |
| 6 | SCL |
| 7 | AGND |
| 8 | PWDN |
| 9 | AVDD 2.8V |
| 10 | DVDD 1.2V |
| 11 | FSIN |
| 12 | STROBE |
| 13 | DGND |
| 14 | XCLK |
| 15 | DGND |
| 16 | MDP3 |
| 17 | MDN3 |
| 18 | DGND |
| 19 | MDP2 |
| 20 | MDN2 |
| 21 | DGND |
| 22 | MDP0 |
| 23 | MDN0 |
| 24 | DGND |
| 25 | MCP |
| 26 | MCN |
| 27 | DGND |
| 28 | MDP1 |
| 29 | MDN1 |
| 30 | DGND |



TOP VIEW



SIDE VIEW



BOTTOM VIEW

NOTE:
1. The device slave address: 0x20(w); 0x21(r)

Parameters:

1. Sensor specification:

Image Sensor: OV13850R2A
Pixel: 1.12umx1.12um
Lens Type: 1/3.06
Important Voltage Description: DVDD1.2V (external power supply);

2. Lens specification:

FOV: 74.4°
F/NO: 2.2
TV Distortion: <1.5%
Focal length: 3.81mm
Composition: 5P+IR FILTER
IR Cut Coating: 650nm±10nm@50%

Kai Lap Technologies Group Ltd

Designed By

Kevin

Model Name:

KL-T4K-OV13850 V2.0

Checked By

Aouly Yan

Projection Type:



Unit: mm

Material: -----

Scale: 1:1

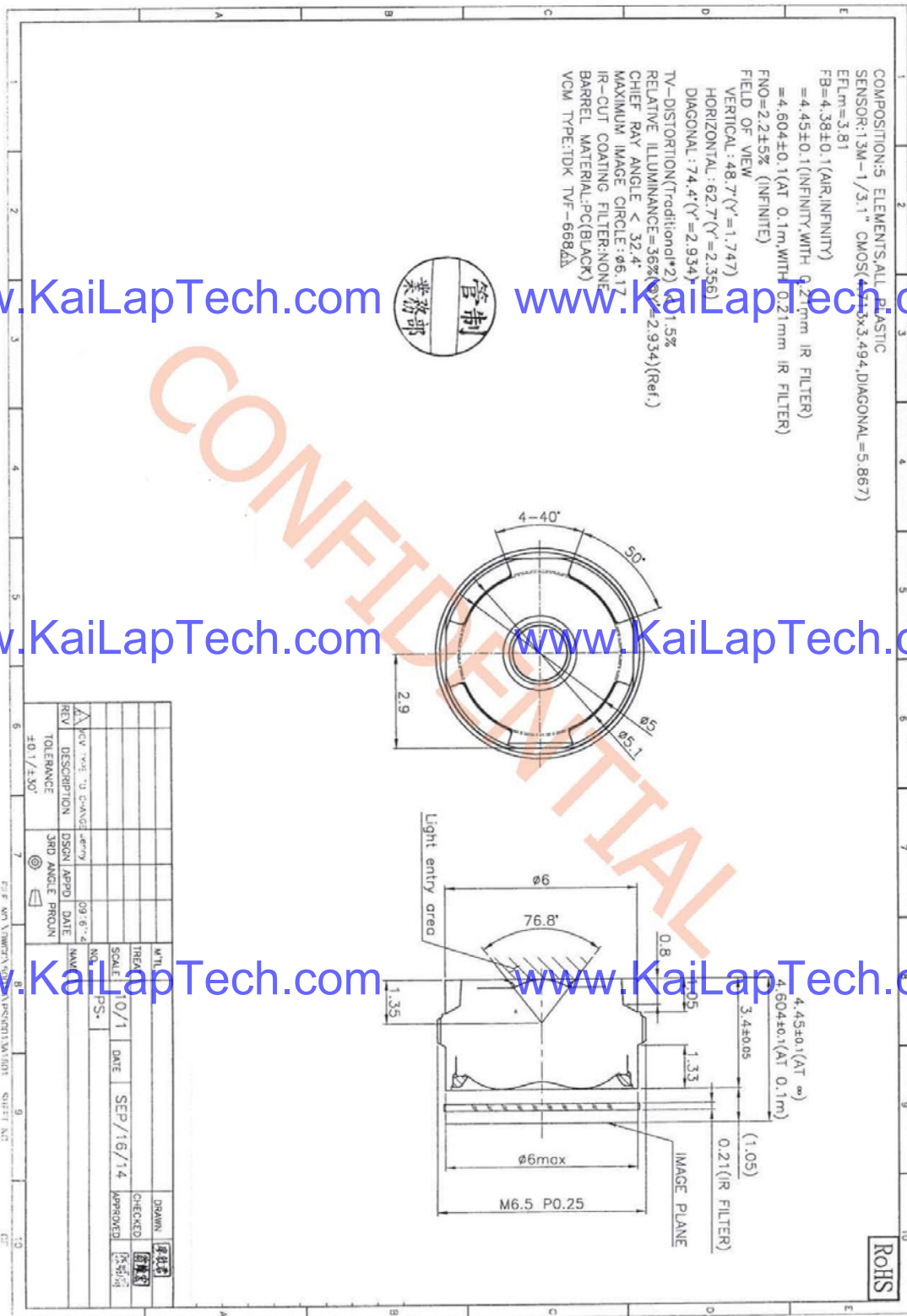
Sheet: 1 of 1

Version: 1/0

| Version | Information | Date |
|---------|--------------------------|------------|
| V1.0 | First Version | 12-04-2017 |
| V2.0 | Updating PIN assignments | 4-21-2020 |



Lens Model: KLT-LENS-50013A1



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FEATURES

- 120mA output driver with 10-bit resolution DAC
- Smart Actuator Control (SAC™) modes
- Supply voltage (V_{DD}): 2.3V to 4.3V
- I/O voltage (V_{IN}): 1.8V to V_{DD}
- Fast mode and Fast mode plus I²C interface compatible
- Power On Reset (POR)
- Power Down (PD) mode current consumption less than 1uA
- Package: 6-pin WLCSP (0.77mm x 1.14mm x 0.30mm)

APPLICATIONS

- Mobile camera
- Digital still camera
- Camcorder
- Web camera
- Action camera

GENERAL DESCRIPTION

The DW9714P designed for linear control of Voice Coil Motors (VCM). This device is compatible with DW9714. The DW9714P has a single 10-bit DAC with 120mA output current sink capability. This device features SAC™ mode which can minimize the mechanical vibration and achieve very fast mechanical settling time. The SAC™ is protected by patent and registered trademark of DONGWOON ANATECH.

The DW9714P operates from a single 2.3V to 4.3V supply. The internal DAC is controlled via an I²C serial interface that operates at clock rate up to 1MHz. The I²C address for the DW9714P is 0x18. The DW9714P offers PD mode with current consumption less than 1uA.

The DW9714P can be used for auto focus applications in mobile cameras, digital still cameras, camcorders, web cameras and action cameras.

TYPICAL APPLICATION CIRCUIT

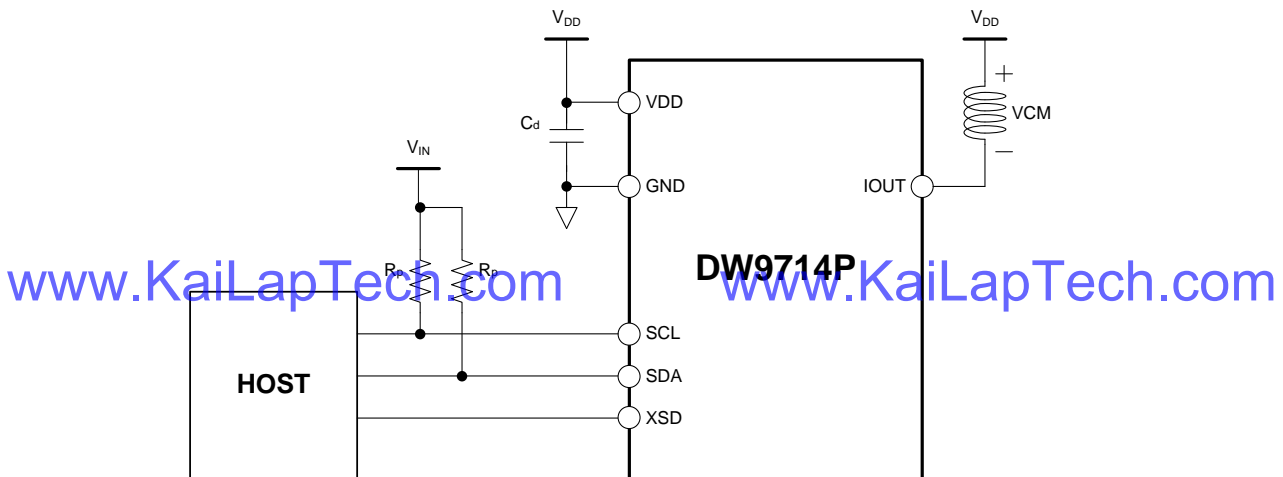
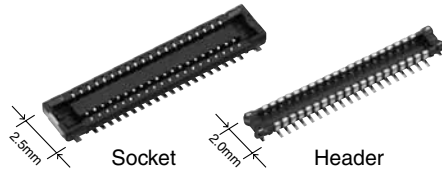


Figure 1. Typical application circuit



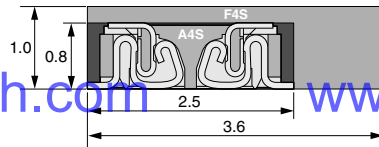
RoHS compliant

FEATURES

1. 2.5 mm wide slim two-piece style connectors

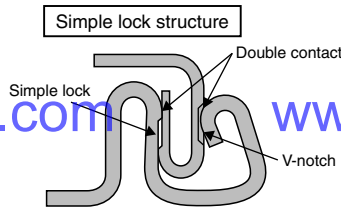
Compact and slim structure contributes overall miniaturization of product design. <Compared to F4S series (40 pin contacts, when mated)>

- Width: 30% down
- Footprint: 30% down



2. "TOUGH CONTACT ADVANCED" ensures high resistance to various environments in lieu of slim and low profile body

3. Simple lock structure provides tactile feedback to ensure excellent mating/unmating operation feel.



The connector gives the tactile feedback when inserted, allowing reliable mating.

- 4. Mated heights of 0.8 and 1.0 mm are available for the same foot pattern.
- 5. Connectors for inspection available

APPLICATIONS

Recommended for board-to-FPC connections of mobile equipment, such as cellular phones, smart phones, laptops, and portable music players

ORDERING INFORMATION

| | | | | | | |
|---|-----|--|--|--|---|---|
| | AXE | | | | 2 | 4 |
| 5: Narrow Pitch Connector A4S (0.4 mm pitch) Socket | | | | | | |
| 6: Narrow Pitch Connector A4S (0.4 mm pitch) Header | | | | | | |
| Number of pins (2 digits) | | | | | | |
| Mated height | | | | | | |
| <Socket> | | | | | | |
| 1: For mated height 0.8/1.0 mm | | | | | | |
| <Header> | | | | | | |
| 1: For mated height 0.8 mm | | | | | | |
| 2: For mated height 1.0 mm | | | | | | |
| Functions | | | | | | |
| 2: Without positioning bosses | | | | | | |
| Surface treatment (Contact portion / Terminal portion) | | | | | | |
| <Socket> | | | | | | |
| 4: Ni plating on base, Au plating on surface (for Ni barrier available) | | | | | | |
| <Header> | | | | | | |
| 4: Ni plating on base, Au plating on surface | | | | | | |

PRODUCT TYPES

| Mated height | Number of pins | Part number | | Packing | |
|--------------|----------------|-------------|-----------|-----------------------|---------------|
| | | Socket | Header | Inner carton (1-reel) | Outer carton |
| 0.8mm | 10 | AXE510124 | AXE610124 | 5,000 pieces | 10,000 pieces |
| | 12 | AXE512124 | AXE612124 | | |
| | 14 | AXE514124 | AXE614124 | | |
| | 16 | AXE516124 | AXE616124 | | |
| | 18 | AXE518124 | AXE618124 | | |
| | 20 | AXE520124 | AXE620124 | | |
| | 22 | AXE522124 | AXE622124 | | |
| | 24 | AXE524124 | AXE624124 | | |
| | 26 | AXE526124 | AXE626124 | | |
| | 28 | AXE528124 | AXE628124 | | |
| | 30 | AXE530124 | AXE630124 | | |
| | 32 | AXE532124 | AXE632124 | | |
| | 34 | AXE534124 | AXE634124 | | |
| | 36 | AXE536124 | AXE636124 | | |
| | 38 | AXE538124 | AXE638124 | | |
| | 40 | AXE540124 | AXE640124 | | |
| | 44 | AXE544124 | AXE644124 | | |
| | 50 | AXE550124 | AXE650124 | | |
| | 54 | AXE554124 | AXE654124 | | |
| | 56 | AXE556124 | AXE656124 | | |
| 60 | AXE560124 | AXE660124 | | | |
| 64 | AXE564124 | AXE664124 | | | |
| 70 | AXE570124 | AXE670124 | | | |
| 80 | AXE580124 | AXE680124 | | | |
| 1.0mm | 10 | AXE510124 | AXE610224 | 5,000 pieces | 10,000 pieces |
| | 12 | AXE512124 | AXE612224 | | |
| | 14 | AXE514124 | AXE614224 | | |
| | 20 | AXE520124 | AXE620224 | | |
| | 24 | AXE524124 | AXE624224 | | |
| | 26 | AXE526124 | AXE626224 | | |
| | 30 | AXE530124 | AXE630224 | | |
| | 32 | AXE532124 | AXE632224 | | |
| | 40 | AXE540124 | AXE640224 | | |
| | 44 | AXE544124 | AXE644224 | | |
| | 50 | AXE550124 | AXE650224 | | |
| | 54 | AXE554124 | AXE654224 | | |
| 60 | AXE560124 | AXE660224 | | | |
| 70 | AXE570124 | AXE670224 | | | |
| 80 | AXE580124 | AXE680224 | | | |

- Notes: 1. Order unit:
 For volume production: 1-inner carton (1-reel) units
 Samples for mounting check: 50-connector units. Please contact our sales office.
 Samples: Small lot orders are possible. Please contact our sales office.
2. The above part numbers are for connectors without positioning bosses, which are standard. When ordering connectors with positioning bosses, please contact our sales office.
3. Please contact us for connectors having a number of pins other than those listed above.

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AXE5, 6

SPECIFICATIONS

■ Characteristics

| | Item | Specifications | Conditions |
|-------------------------------|---|--|--|
| Electrical characteristics | Rated current | 0.3A/pin contact (Max. 5 A at total pin contacts) | |
| | Rated voltage | 60V AC/DC | |
| | Breakdown voltage | 150V AC for 1 min. | No short-circuiting or damage at a detection current of 1 mA when the specified voltage is applied for one minute. |
| | Insulation resistance | Min. 1,000MΩ (initial) | Using 250V DC megger (applied for 1 min.) |
| | Contact resistance | Max. 90mΩ | Based on the contact resistance measurement method specified by JIS C 5402. |
| Mechanical characteristics | Composite insertion force | Max. 1.200N/pin contacts × pin contacts (initial) | |
| | Composite removal force | Min. 0.165N/pin contacts × pin contacts | |
| | Contact holding force (Socket contact) | Min. 0.20N/pin contacts | Measuring the maximum force. As the contact is axially pull out. |
| Environmental characteristics | Ambient temperature | -55°C to +85°C | No freezing at low temperatures. No dew condensation. |
| | Soldering heat resistance | Peak temperature: 260°C or less (on the surface of the PC board around the connector terminals) 300°C within 5 sec. 350°C within 3 sec. | Infrared reflow soldering Soldering iron |
| | Storage temperature | -55°C to +85°C (product only) -40°C to +50°C (emboss packing) | No freezing at low temperatures. No dew condensation. |
| | Thermal shock resistance (header and socket mated) | 5 cycles, insulation resistance min. 100MΩ, contact resistance max. 90mΩ | Sequence 1. -55°C, 30 minutes 2. ~, Max. 5 minutes 3. 85°C, 30 minutes 4. ~, Max. 5 minutes |
| | Humidity resistance (header and socket mated) | 120 hours, insulation resistance min. 100MΩ, contact resistance max. 90mΩ | Bath temperature 40±2°C, humidity 90 to 95% R.H. |
| | Saltwater spray resistance (header and socket mated) | 24 hours, insulation resistance min. 100MΩ, contact resistance max. 90mΩ | Bath temperature 35±2°C, saltwater concentration 5±1% |
| | H ₂ S resistance (header and socket mated) | 48 hours, contact resistance max. 90mΩ | Bath temperature 40±2°C, gas concentration 3±1 ppm, humidity 75 to 80% R.H. |
| | Lifetime characteristics | Insertion and removal life | 30 times |
| Unit weight | | 20 pin contact type: Socket: 0.02 g Header: 0.01 g | |

■ Material and surface treatment

| Part name | Material | Surface treatment |
|------------------|---------------------|--|
| Molded portion | LCP resin (UL94V-0) | — |
| Contact and Post | Copper alloy | Contact portion: Base: Ni plating Surface: Au plating Terminal portion: Base: Ni plating Surface: Au plating (except the terminal tips) The socket terminals close to the portion to be soldered have nickel barriers (exposed nickel portions). Soldering terminals: Sockets: Base: Ni plating Surface: Pd+Au flash plating (except the terminal tips) Headers: Base: Ni plating Surface: Au plating (except the terminal tips) |

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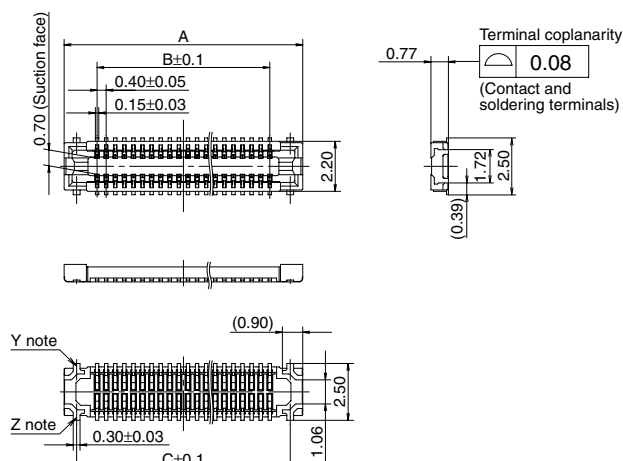
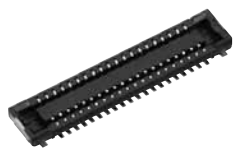
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DIMENSIONS (Unit: mm)

The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e>

Socket (Mated height: 0.8 mm/1.0 mm)

CAD Data



Dimension table (mm)

| Number of pins/dimension | A | B | C |
|--------------------------|------|------|------|
| 10 | 4.5 | 1.6 | 3.4 |
| 12 | 4.9 | 2.0 | 3.8 |
| 14 | 5.3 | 2.4 | 4.2 |
| 16 | 5.7 | 2.8 | 4.6 |
| 18 | 6.1 | 3.2 | 5.0 |
| 20 | 6.5 | 3.6 | 5.4 |
| 22 | 6.9 | 4.0 | 5.8 |
| 24 | 7.3 | 4.4 | 6.2 |
| 26 | 7.7 | 4.8 | 6.6 |
| 28 | 8.1 | 5.2 | 7.0 |
| 30 | 8.5 | 5.6 | 7.4 |
| 32 | 8.9 | 6.0 | 7.8 |
| 34 | 9.3 | 6.4 | 8.2 |
| 36 | 9.7 | 6.8 | 8.6 |
| 38 | 10.1 | 7.2 | 9.0 |
| 40 | 10.5 | 7.6 | 9.4 |
| 44 | 11.3 | 8.4 | 10.2 |
| 50 | 12.5 | 9.6 | 11.4 |
| 54 | 13.3 | 10.4 | 12.2 |
| 56 | 13.7 | 10.8 | 12.6 |
| 60 | 14.5 | 11.6 | 13.4 |
| 64 | 15.3 | 12.4 | 14.2 |
| 70 | 16.5 | 13.6 | 15.4 |
| 80 | 18.5 | 15.6 | 17.4 |

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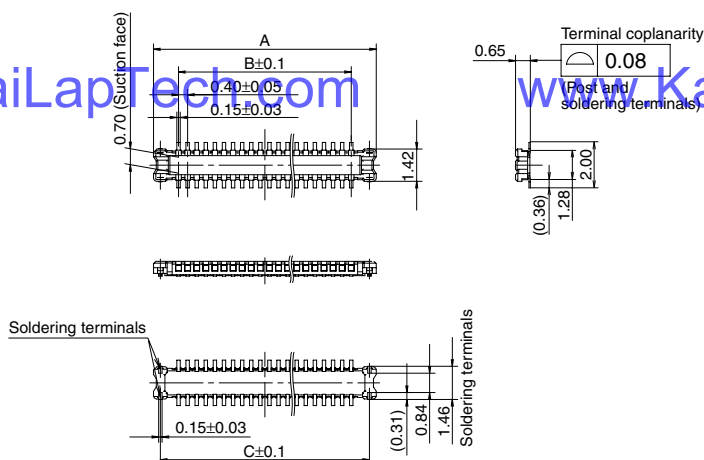
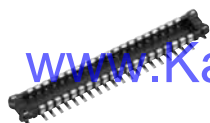
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General tolerance: ±0.2

Note: Since the soldering terminals has a single-piece construction, sections Y and Z are electrically connected.

Header (Mated height: 0.8 mm)

CAD Data



Dimension table (mm)

| Number of pins/dimension | A | B | C |
|--------------------------|------|------|------|
| 10 | 3.8 | 1.6 | 3.2 |
| 12 | 4.2 | 2.0 | 3.6 |
| 14 | 4.6 | 2.4 | 4.0 |
| 16 | 5.0 | 2.8 | 4.4 |
| 18 | 5.4 | 3.2 | 4.8 |
| 20 | 5.8 | 3.6 | 5.2 |
| 22 | 6.2 | 4.0 | 5.6 |
| 24 | 6.6 | 4.4 | 6.0 |
| 26 | 7.0 | 4.8 | 6.4 |
| 28 | 7.4 | 5.2 | 6.8 |
| 30 | 7.8 | 5.6 | 7.2 |
| 32 | 8.2 | 6.0 | 7.6 |
| 34 | 8.6 | 6.4 | 8.0 |
| 36 | 9.0 | 6.8 | 8.4 |
| 38 | 9.4 | 7.2 | 8.8 |
| 40 | 9.8 | 7.6 | 9.2 |
| 44 | 10.6 | 8.4 | 10.0 |
| 50 | 11.8 | 9.6 | 11.2 |
| 54 | 12.6 | 10.4 | 12.0 |
| 56 | 13.0 | 10.8 | 12.4 |
| 60 | 13.8 | 11.6 | 13.2 |
| 64 | 14.6 | 12.4 | 14.0 |
| 70 | 15.8 | 13.6 | 15.2 |
| 80 | 17.8 | 15.6 | 17.2 |

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General tolerance: ±0.2



OV13850 13MP product brief



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Power-Efficient 13-Megapixel Image Sensor with Best-In-Class Performance

for High-End Smartphones and Tablets



available in a lead free package

The OV13850 is a high performance PureCel™ 13-megapixel CameraChip™ sensor that delivers best-in-class high- and low-light performance, as well as dramatically reduced power consumption for smartphones and tablets.

The OV13850 sensor offers a number of performance enhancements, including improved full-well capacity (FWC) and sensitivity for industry-leading high- and low-light performance. It also offers a 40 percent reduction in power consumption compared to our previous generation sensor, making the OV13850 ideally suited for feature-rich mobile devices.

The 1/3.06-inch OV13850 supports an active array of 4224 x 3136 pixels (13.2-megapixels) operating at 30 frames per second (fps) for zero shutter lag and can seamlessly transition between recording video and capturing still images. Additionally, the sensor supports 4K2K ultra-high definition video at 30 fps with full-horizontal field of view (FOV) and electronic image stabilization (EIS), as well as high frame rate 1080p HD video at 60 fps with EIS to enable high quality videos.

The OV13850 fits into an industry standard 8.5 x 8.5 x 5 mm module.

Find out more at www.ovt.com.

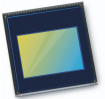
Applications

- Cellular Phones
- Tablets
- PC Multimedia

Product Features

- PureCel™ image sensor
- 1.12 μm x 1.12 μm pixel
- optical size of 1/3.06"
- 31.2° CRA for <6 mm z-height
- programmable controls for frame rate, mirror and flip, cropping, and windowing
- support for image sizes: 1.2MP (4224x3136), 10MP (16392x4224x2376), 4K2K (3840x2160), EIS 1080p (2112x1188), EIS 720p (1408x792), and more
- 13.2MP at 30 fps
- two-wire serial bus control (SCCB)
- strobe output to control flash
- 8 kbits of embedded one-time programmable (OTP) memory
- two on-chip phase lock loops (PLLs)
- programmable controls: gain, exposure, frame rate, image size, horizontal mirror, vertical flip, cropping, and panning
- image quality controls: defect pixel correction, automatic black level calibration, lens shading correction, and alternate row HDR
- built-in temperature sensor
- suitable for module size of 8.5 x 8.5 x <6 mm

OV13850



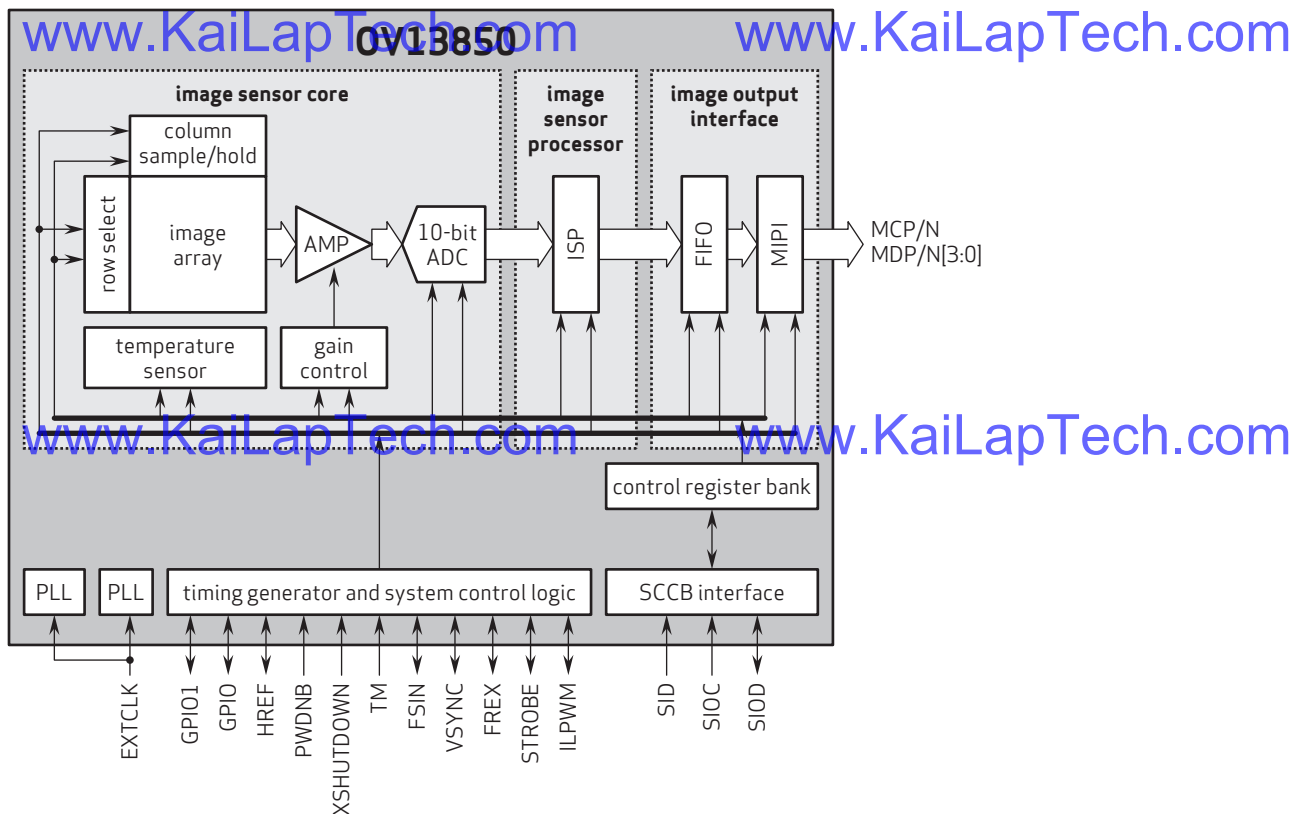
Ordering Information

- OV13850-G04A**
(color, chip probing, 200 μm backgrinding, reconstructed wafer with good die)

Product Specifications

- active array size:** 4224 x 3136
- power supply:**
 - core: 1.14 - 1.26V (1.2V nominal)
 - analog: 2.6 - 3.0V (2.8V nominal)
 - I/O: 1.7 - 3.0V (1.8V or 2.8V nominal)
- power requirements:**
 - active: 223 mW
 - standby: 300 μW
 - XSHUTDOWN: 1 μW
- temperature range:**
 - operating: -30°C to +85°C junction temperature
 - stable image: 0°C to +60°C junction temperature
- output interfaces:** up to 4-lane MIPI serial output
- output formats:** 10-bit RGB RAW
- lens size:** 1/3.06"
- lens chief ray angle:** 31.2°
- input clock frequency:** 6 - 64 MHz
- maximum image transfer rate:** 30 fps
- scan mode:** progressive
- pixel size:** 1.12 μm x 1.12 μm
- image area:** 4815 μm x 3678.3 μm
- die dimensions:** 6210 μm x 5517 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 | | 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 | | | | | | | |



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.

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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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KLT Strength

Powerful Factory



Professional Service



Promised Delivery



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