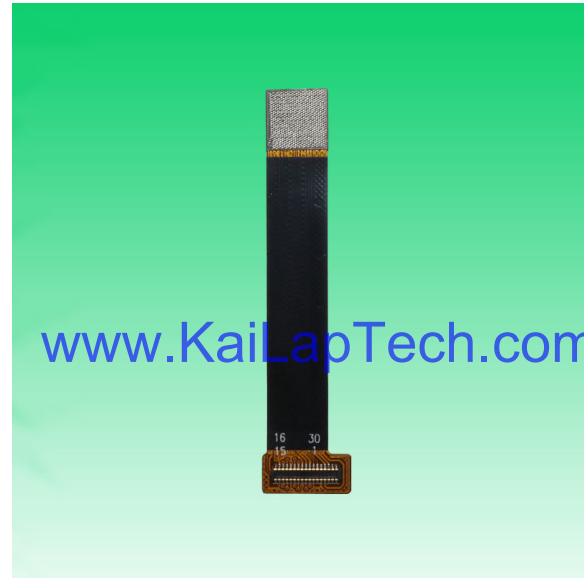


## KLT-U9MF-OV8856 V1.0

### 8MP OmniVision OV8856 MIPI Interface Fixed Focus Camera Module



Front View



Back View

#### Specifications

|                          |                                     |
|--------------------------|-------------------------------------|
| Camera Module No.        | KLT-U9MF-OV8856 V1.0                |
| Resolution               | 8MP                                 |
| Image Sensor             | OV8856                              |
| Sensor Type              | 1/4"                                |
| Pixel Size               | 1.12 um x 1.12 um                   |
| EFL                      | 2.93 mm                             |
| F.NO                     | 2.00                                |
| Pixel                    | 3264 x 2448                         |
| View Angle               | 75.0°(DFOV) 62.8°(HFOV) 49.3°(VFOV) |
| Lens Dimensions          | 6.50 x 6.50 x 4.72 mm               |
| Module Size              | 42.80 x 9.53 mm                     |
| Module Type              | Fixed Focus                         |
| Interface                | MIPI                                |
| Auto Focus VCM Driver IC | None                                |
| Lens Model               | KLT-LENS-9570A3                     |
| Lens Type                | 650nm IR Cut                        |
| Operating Temperature    | -30°C to +85°C                      |
| Mating Connector         | BM20B(0.8)-30DS-0.4V(51)            |



## KLT-U9MF-OV8856 V1.0

### 8MP OmniVision OV8856 MIPI Interface Fixed Focus Camera Module



Top View



Side View

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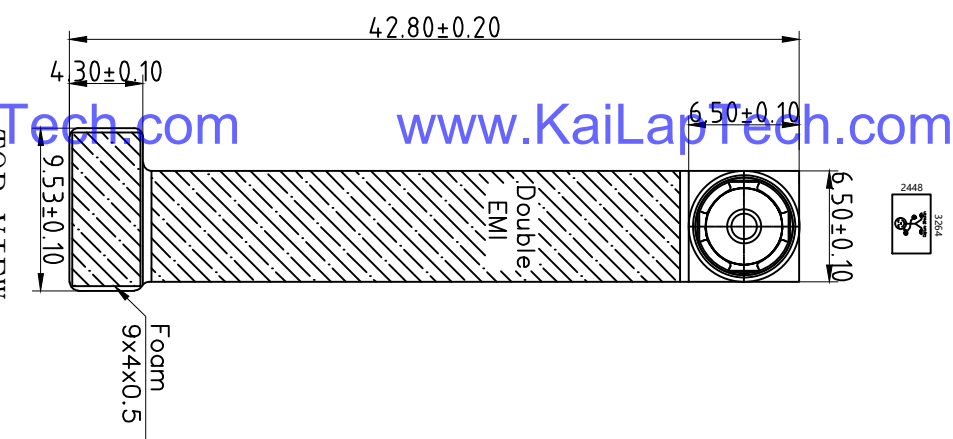
Bottom View



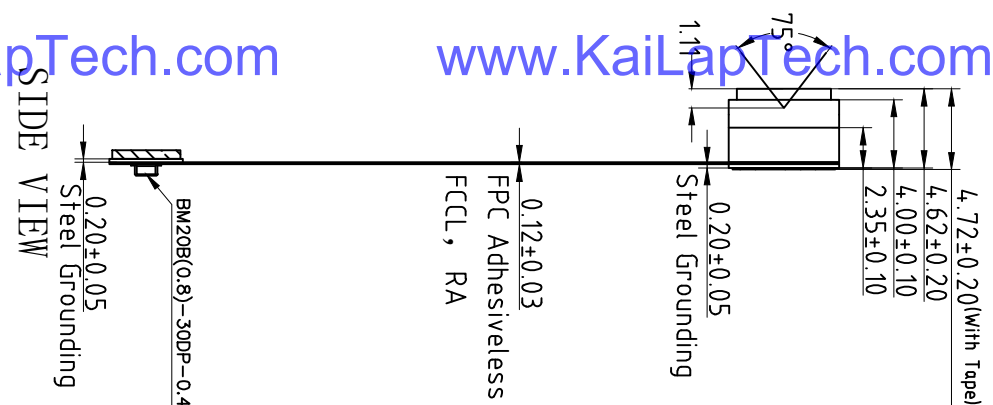
Mating Connector

| D       |               | E        |  |
|---------|---------------|----------|--|
| Version | Information   | Date     |  |
| V1.0    | First Version | 9-5-2020 |  |

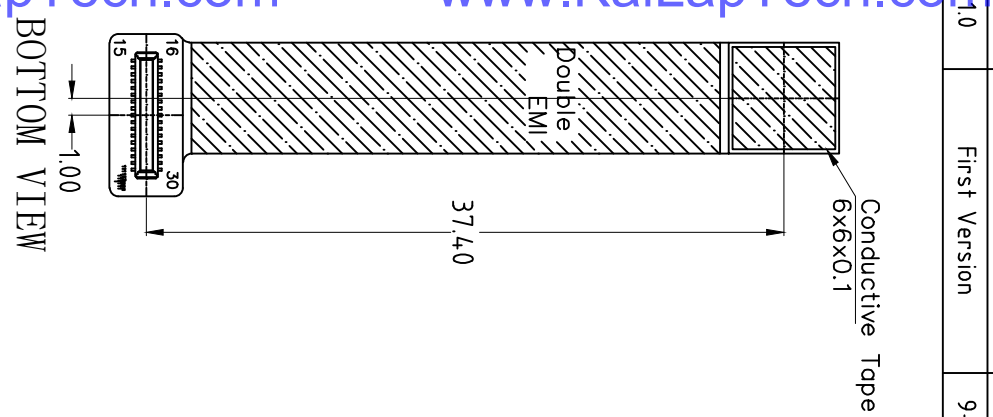
| A    |            |
|------|------------|
| RoHS |            |
| 0    | SIGNAL     |
| 1    | NC         |
| 2    | NC         |
| 3    | AVDD 2.8V  |
| 4    | DGND       |
| 5    | RESET      |
| 6    | DGND       |
| 7    | MDP3       |
| 8    | MDN3       |
| 9    | DGND       |
| 10   | MDP1       |
| 11   | MDN1       |
| 12   | DGND       |
| 13   | MDP4       |
| 14   | MDN4       |
| 15   | DGND       |
| 16   | DGND       |
| 17   | MDN2       |
| 18   | MDP2       |
| 19   | DGND       |
| 20   | MCN        |
| 21   | MCP        |
| 22   | DGND       |
| 23   | MCLK       |
| 24   | DGND       |
| 25   | SCL        |
| 26   | SDA        |
| 27   | NC         |
| 28   | DOVDD 1.8V |
| 29   | AGND       |
| 30   | DVDD 1.2V  |



TOP VIEW



SIDE VIEW



BOTTOM VIEW

NOTE:  
1. The device slave address: 0x6C

Parameter:

1、 Sensor specification:

Image Sensor: OV8856  
Pixel: 1.12um×1.12um  
Lens Type: 1/4  
Important Voltage Description: DVDD1.2V (external power supply);

2、 Lens specification:

FOV: 75°(D),62.8°(H),49.3°(V)  
F/#NO.: 2.0  
FV distortion: <1.0%  
Focal length: 2.96mm  
Composition: 5P+IR FILTER  
IR Cut Coating: 650nm±10nm@50%

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|             |           |                  |                      |
|-------------|-----------|------------------|----------------------|
| Designed By | Kevin     | Model Name:      | KLT-U9MF-OV8856 V1.0 |
| Checked By  | Aouly_Xan | Projection Type: | Third Angle          |
|             |           | Unit:            | mm                   |
|             |           | Scale:           | 1:1                  |
|             |           | Sheet:           | 1 of 1               |
|             |           | Version:         | 1/0                  |

A

B

C

D

E

3

2

1

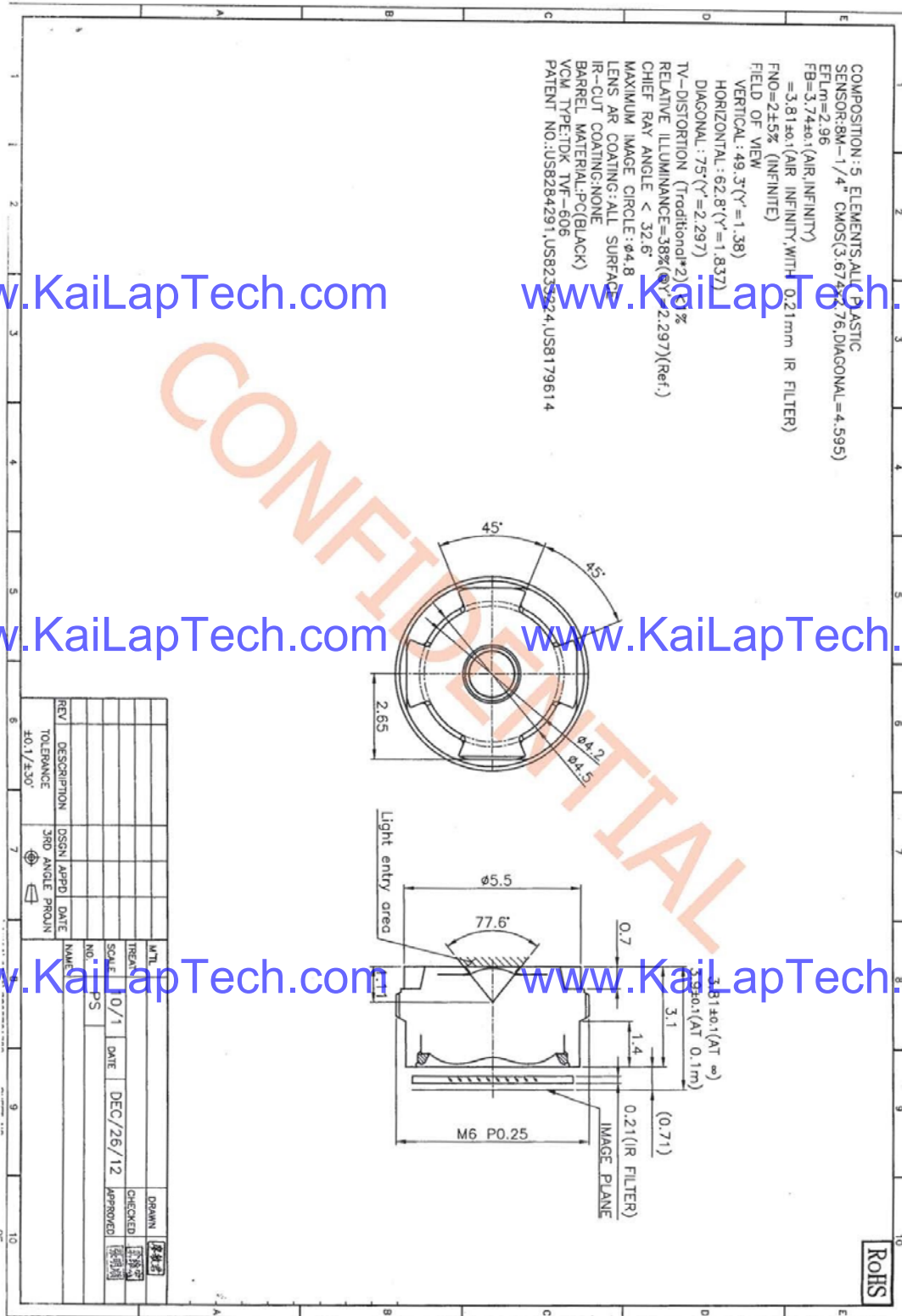
3

2

1



Lens Model: KLT-LENS-9570A3



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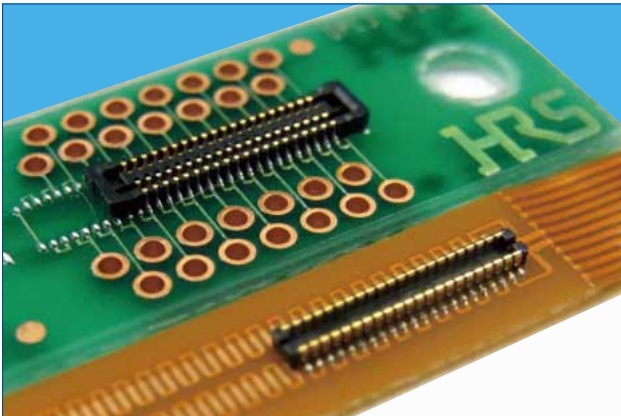
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# 0.4mm Pitch, 0.6 and 0.8mm Height, Board-to-Board and Board-to-FPC Connectors

## BM20 Series



[www.KaiLapTech.com](http://www.KaiLapTech.com)

### ■ Features

#### 1. High density mounting capability

A space saving design that keeps the connector compact, but still maintains an adequate vacuum area (no less than 0.7mm wide).  
Depth DS : 2.3mm DP : 1.78mm

#### 2. Reliable contact performance

Even though the mated height is low, the BM20 still leads it class in maximum effective mating lengths for each mating height.

<Effective Mating Length>

Height 0.8mm : 0.2mm

Height 0.6mm : 0.15mm

The addition of the two point contact system adds more reliability to the contacts.

#### 3. No restrictions to PCB pattern design for the 0.8 mm height connector \*1

This series utilizes a thin wall to insulate the bottom surface of the connector and maintains an effective mating length of 0.2mm. This removes any restriction for PCB pattern layout design under the connector.

Note \*1: There are some restrictions for the 0.6 mm height style.

#### 4. Enhanced mating operations

The structure uses guide ribs to ease the mating process and offers a self alignment range of up to 0.3mm. A clear tactile click is used as an indicator to the user that the mating process was completed.

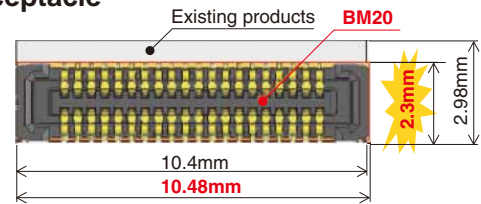
#### 5. Drop and shock resistant structure

Dimples were designed into the contacts to increase their retention force and to absorb the shock delivered from a drop or other impact.

#### 6. Debris resisting design

When mated, the connector's design covers the contacts which help to keep dust and other debris away from the contacts. The SMT leads are kept very close to the connector housing which also helps to prevent shorts caused by debris on the exposed contacts

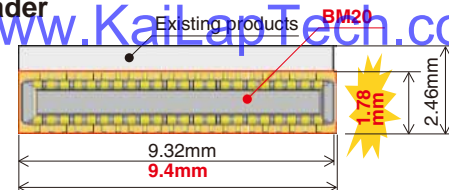
### ■ Receptacle



A 22.3% reduction in size!

| Existing products                          | BM20                                       |
|--|--|
| 2.98 × 10.4<br>= About 31.0mm <sup>2</sup> | 2.3 × 10.48<br>= About 24.1mm <sup>2</sup> |

### ■ Header

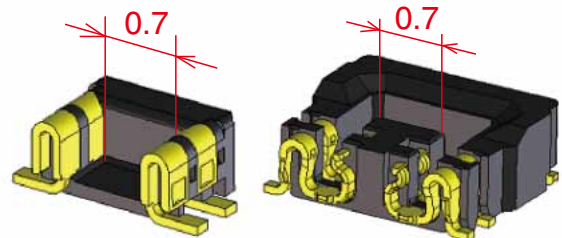


A 27.1% reduction in size!

| Existing products                          | BM20                                      |
|--|---|
| 2.46 × 9.32<br>= About 22.9mm <sup>2</sup> | 1.78 × 9.4<br>= About 16.7mm <sup>2</sup> |

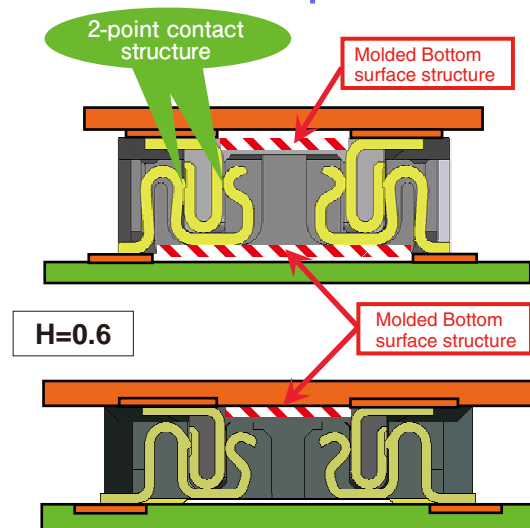
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### Vacuum pick-up



### Mating diagram (cross section)

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## Product Specifications

| Ratings                      | Rated Current  | 0.3A       | Operating Temperature Range   | - 35 ~ 85°C (Note 1) | Storage Temperature Range | - 10 ~ 60°C (Note 2) |
|------------------------------|--|------------|---|----------------------|---------------------------|----------------------|
|                              | Rated Voltage  | AC, DC 30V | Operating Humidity Range  | 20 ~ 80%             | Storage Humidity Range    | 40 ~ 70% (Note 2)    |
| Items                        | Specifications   |            | Conditions  |                      |                           |                      |
| 1. Insulation Resistance     | Minimum of 50MΩ  |            | Measured with DC 100V   |                      |                           |                      |
| 2. Withstanding Voltage      | No flashover or breakdown  |            | Apply AC 100V for 1 minute  |                      |                           |                      |
| 3. Contact Resistance        | Maximum of 100mΩ   |            | Measured with AC 20 mV, 1 kHz and 1 mA  |                      |                           |                      |
| 4. Vibration Resistance      | No electrical discontinuity of 1μs or greater                                |            | Frequency 10-55 Hz, half amplitude 0.75mm, 3 directions for 2 hours   |                      |                           |                      |
| 5. Humidity Resistance       | Contact resistance Maximum of 100mΩ<br>Insulation resistance Minimum of 25mΩ |            | Left at temperature 40±2°C, humidity 90 to 95%, 96 hours  |                      |                           |                      |
| 6. Temperature Cycles        | Contact resistance Maximum of 100mΩ<br>Insulation resistance Minimum of 50mΩ |            | (-55°C : 30 minutes → 5~35°C : 10 minutes → 85°C : 30 minutes → 5~35°C : 10 minutes) 5 cycles                                   |                      |                           |                      |
| 7. Durability                | Contact Resistance: maximum of 100mΩ   |            | 10 mating cycles  |                      |                           |                      |
| 8. Soldering Heat Resistance | Should be no melting of resin parts that affects its performance             |            | Reflow : according to the Recommended Solder Profile<br>Hand solder : Soldering iron temperature 350°C, no more than 3 seconds. |                      |                           |                      |

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The term "storage" here refers to products stored for a long period prior to board mounting and use. The operating temperature and humidity range covers the non-energized condition of connectors after board mounting and the temporary storage conditions during transportation, etc.

## Materials

| Product    | Component | Materials          | Finish       | UL Regulation |
|------------|-----------|--------------------|--------------|---------------|
| Receptacle | Insulator | LCP                | Black        | UL94V-0       |
| Header     | Contact   | Phosphorous bronze | Gold plating | —             |

## Product Number Structure

Refer to this page when determining product specifications by model types. Please place orders with part numbers listed in this catalog. The characteristics and specifications of the product described in this catalog are reference values. Please make sure to check the latest delivery specifications at the time of product use.

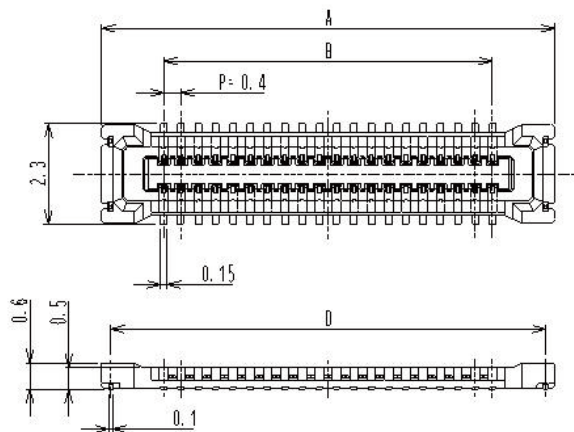
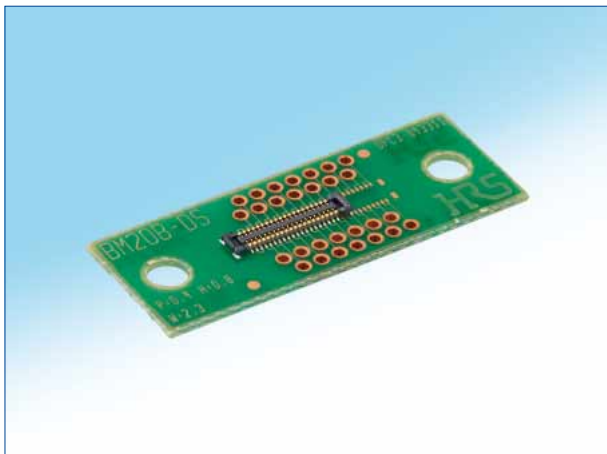
### ●Receptacle/Header

**BM 20 # (\*\* ) - \* DS - 0.4 V (51)**

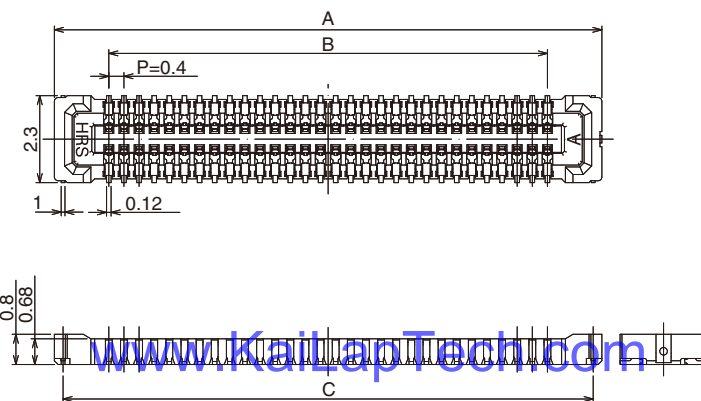
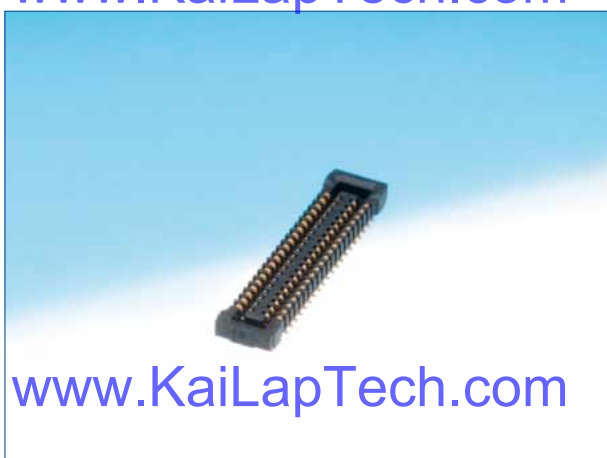
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

|   |  |
|---|--|
| ① Series Name : BM                                    | ⑥ Connector Type<br>DS : Double row receptacle<br>DP : Double row header |
| ② Series No. : 20                                     | ⑦ Contact Pitch : 0.4mm  |
| ③ Shape Symbols<br>B : With reinforcing metal fitting |  |
| ④ Stack height : 0.6mm, 0.8mm                         | ⑧ Terminal Shape V : Vertical SMT  |
| ⑤ No. of Contacts : Please refer to page 3 and after. | ⑨ Packaging<br>(51) : Embossed tape package (8,000 pieces per reel)      |

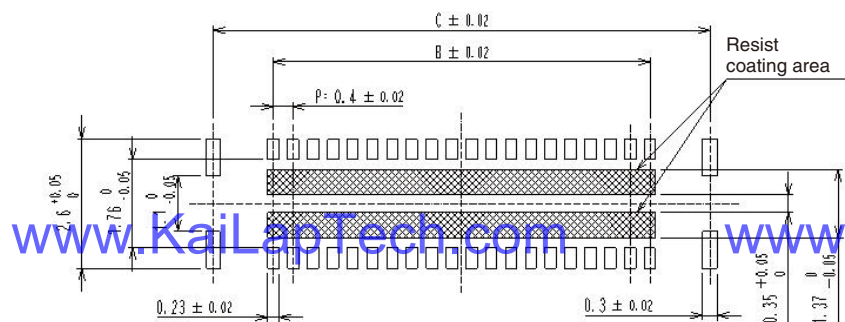
■ H=0.6mm receptacle



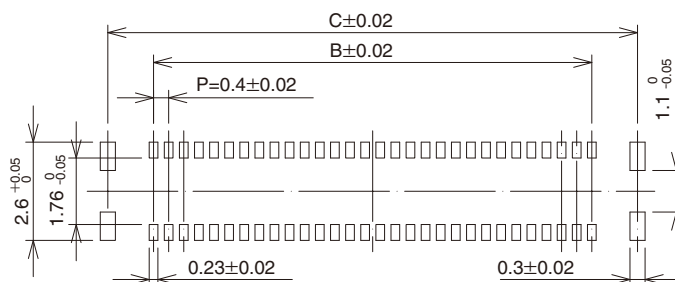
■ H=0.8mm receptacle



◆ Recommended PCB layout [H= 0.6mm]



◆ Recommended PCB layout [H= 0.8mm]



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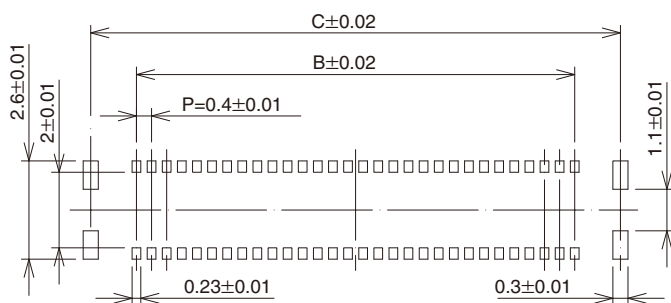
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◆Recommended metal mask size (Mask thickness 100 μm) [0.6 mm and 0.8 mm common]



Unit : mm

| Part No.                 | HRS No.        | No. of Contacts | A     | B    | C     | D     |
|--------------------------|----------------|-----------------|-------|------|-------|-------|
| BM20B(0.6)-10DS-0.4V(51) | 0684-9308-8 51 | 10              | 4.48  | 1.6  | 4.02  | 4.06  |
| BM20B(0.6)-20DS-0.4V(51) | 0684-9309-0 51 | 20              | 6.48  | 3.6  | 6.02  | 6.06  |
| BM20B(0.6)-24DS-0.4V(51) | 0684-9310-0 51 | 24              | 7.28  | 4.4  | 6.82  | 6.86  |
| BM20B(0.6)-30DS-0.4V(51) | 0684-9311-2 51 | 30              | 8.48  | 5.6  | 8.02  | 8.06  |
| BM20B(0.6)-34DS-0.4V(51) | 0684-9312-5 51 | 34              | 9.28  | 6.4  | 8.82  | 8.86  |
| BM20B(0.6)-40DS-0.4V(51) | 0684-9313-8 51 | 40              | 10.48 | 7.6  | 10.02 | 10.06 |
| BM20B(0.6)-50DS-0.4V(51) | 0684-9314-0 51 | 50              | 12.48 | 9.6  | 12.02 | 12.06 |
| BM20B(0.6)-60DS-0.4V(51) | 0684-9315-3 51 | 60              | 14.48 | 11.6 | 14.02 | 14.06 |

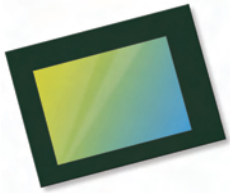
| Part No.                 | HRS No.        | No. of Contacts | A     | B   | C     |
|--------------------------|----------------|-----------------|-------|-----|-------|
| BM20B(0.8)-10DS-0.4V(51) | 0684-9008-4 51 | 10              | 4.48  | 1.6 | 4.02  |
| BM20B(0.8)-16DS-0.4V(51) | 0684-9041-0 51 | 16              | 5.68  | 2.8 | 5.22  |
| BM20B(0.8)-20DS-0.4V(51) | 0684-9009-7 51 | 20              | 6.48  | 3.6 | 6.02  |
| BM20B(0.8)-24DS-0.4V(51) | 0684-9010-6 51 | 24              | 7.28  | 4.4 | 6.82  |
| BM20B(0.8)-30DS-0.4V(51) | 0684-9011-9 51 | 30              | 8.48  | 5.6 | 8.02  |
| BM20B(0.8)-34DS-0.4V(51) | 0684-9020-0 51 | 34              | 9.28  | 6.4 | 8.82  |
| BM20B(0.8)-40DS-0.4V(51) | 0684-9012-1 51 | 40              | 10.48 | 7.6 | 10.02 |
| BM20B(0.8)-50DS-0.4V(51) | 0684-9013-4 51 | 50              | 12.48 | 9.6 | 12.02 |

Note 1 : This product is sold by full reel quantities of 8,000 pieces per reel. Please place orders in full reel quantities.  
 Note 2 : This connector is NOT polarized.

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# OV8856 8MP product brief



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## High Performance PureCel<sup>®</sup> Sensor Brings 8-Megapixel Selfies to Mainstream Smartphones



available in  
a lead free  
package

[www.KaiLapTech.com](http://www.KaiLapTech.com) OmniVision's OV8856 is a new 1/4-inch 8-megapixel PureCel sensor designed for front- and rear-facing camera applications in mainstream mobile devices. Built on advanced 1.12-micron pixel architecture, the extremely compact OV8856 offers industry-leading image quality and improved performance when compared with previous-generation 8-megapixel image sensors.

The 1/4-inch OV8856 leverages OmniVision's PureCel pixel architecture to capture full-resolution 8-megapixel images and video at 30 frames per second (fps), and 1080p high-definition (HD) video at 60 fps. The power-efficient OV8856 sensor also supports

[www.KaiLapTech.com](http://www.KaiLapTech.com) interlaced high dynamic range (iHDR) for clean images and video in high- and low-light conditions. Using a high-speed four-lane MIPI interface, the OV8856 can output full-resolution, 8-megapixel 30 fps video over two MIPI lanes without requiring any data compression.

The OV8856 is one of the smallest 8-megapixel sensors on the market, and is approximately 15 percent smaller than OmniVision's previous-generation OV8858 image sensor. The OV8856 can fit into a 6.5 mm x 6.5 mm fixed-focus module with a z-height of approximately 4 mm.

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



## Applications

- Cellular Phones
- Tablets
- PC Multimedia

## Product Features

- 1.12  $\mu\text{m}$  x 1.12  $\mu\text{m}$  pixel
- optical size of 1/4"
- 32.9° CRA for <5 mm Z-height
- programmable controls for:
  - frame rate
  - mirror and flip
  - cropping
  - windowing
- supports images sizes:
  - QVGA (320x240)
  - BMP (169,8264x1836)
  - EIS 1080p (2112x1188)
  - 1080p (1920x1080)
  - EIS 720p (1408x792), and more
- 8MP at 30 fps (720 Mbps/4-lane or 1.44 Gbps/2-lane)
- two on-chip phase lock loops (PLLs)
- two-wire serial bus control (SCCB)
- 8k bits of embedded one-time programmable (OTP) memory
- image quality control:
  - defect pixel correction
  - automatic black level calibration
  - lens shading corrector
  - alternate row HDR
- suitable for module size of 8.5 x 8.5 x -4 mm

# OV8856



## Ordering Information

- OV08856-GA4A**  
(color, chip probing, 200  $\mu\text{m}$  backgrinding, reconstructed wafer with good die)

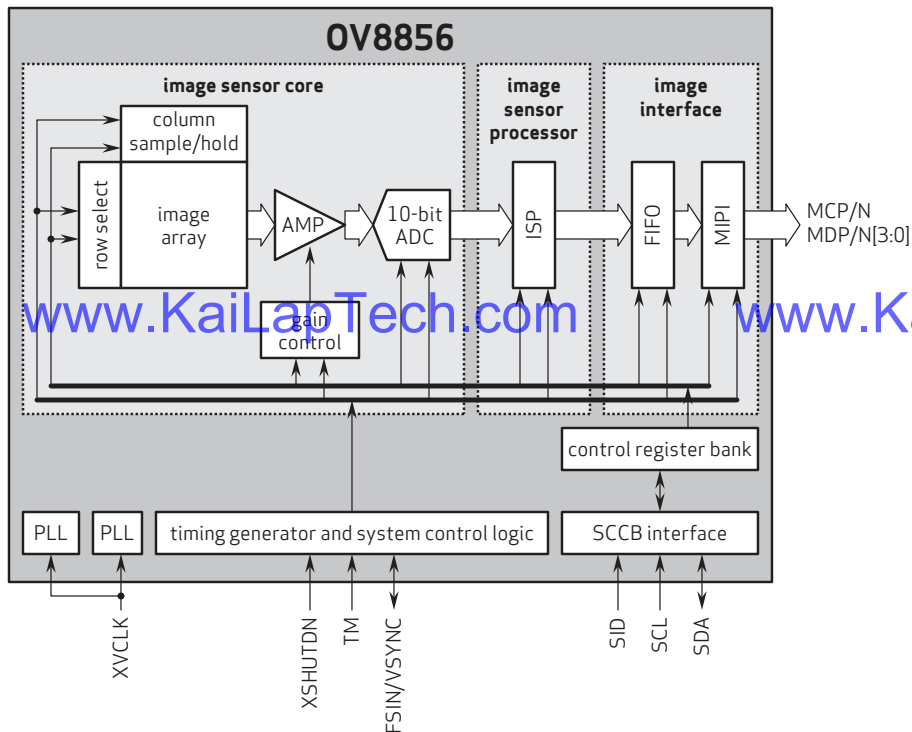
## Product Specifications

- active array size:** 3264 x 2448
- input clock frequency:** 6 - 27 MHz
- power supply:**
  - core: 1.14 - 1.26V (1.2V nominal)
  - analog: 2.6 - 3.0V (2.8V nominal)
  - I/O: 1.7 - 1.9V (1.8V)
- max S/N ratio:** 36.5 dB
- dynamic range:** 70 dB @ 8x gain
- power requirements:**
  - active: 150 mW
  - standby: 0.8  $\mu\text{W}$
  - XSHUTDOWN: 1  $\mu\text{W}$
- maximum image transfer rate:**
  - 3264 x 2448: 30 fps
  - 3264 x 1836: 30 fps
  - 2112 x 1188: 60 fps
  - 1920 x 1080: 60 fps
  - 1408 x 792: 90 fps
- temperature range:**
  - operating: -30°C to +85°C junction temperature
  - stable image: 0°C to +60°C junction temperature
- sensitivity:** 480 mV/lux-sec
- scan mode:** progressive
- output interfaces:** up to 4-lane MIPI serial output
- pixel size:** 1.12  $\mu\text{m}$  x 1.12  $\mu\text{m}$
- output formats:** 10-bit RGB RAW
- dark current:** 12 e<sup>-</sup>/sec @ 60°C junction temperature
- lens chief ray angle:** 32.9° non-linear
- image area:** 3678.336  $\mu\text{m}$  x 2767.68  $\mu\text{m}$
- lens size:** 1/4"
- die dimensions:**
  - COB: 4806  $\mu\text{m}$  x 3969  $\mu\text{m}$
  - RW: 4856  $\mu\text{m}$  x 4019  $\mu\text{m}$

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## Functional Block Diagram



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www.ovt.com

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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            |         |        |       |            |        |           |         |
| <b>MIPI Interface</b>         |      |   |         |        |       |            |        |           |         |
| 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                              |         |        |       |            |        |           |         |
| <b>DVP Parallel Interface</b> |      |   |         |        |       |            |        |           |         |
| 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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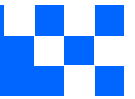




## Camera Reliability Test

| 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<br>Low -20°C 0.5 Hours<br>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<br>60 Seconds<br>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<br>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



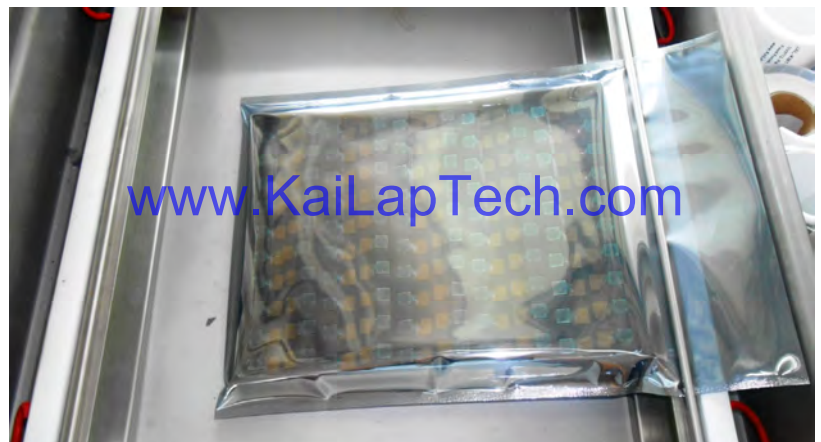
Cover Tray with Lid



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**





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## 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](http://www.KaiLapTech.com). Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. KLT guarantees that the Product(s) will be free from defects in materials and workmanship under normal use for a period of one (1) year from the date you receive the product ("Warranty Period").

For all Product(s) that contain or develop material defects in materials or workmanship during the Warranty Period, KLT will, at its sole option, either: (i) repair the Product(s); (ii) replace the Product(s) with a new or refurbished Product(s) (replacement Product(s) being of identical model or functional equivalent); or (iii) provide you a refund of the price you paid for the Product(s).

This Limited Warranty of KLT is solely limited to repair and/or replacement on the terms set forth above. KLT is not reliable or responsible for any subsequent events.





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## KLT Strength

### Powerful Factory



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### Professional Service



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