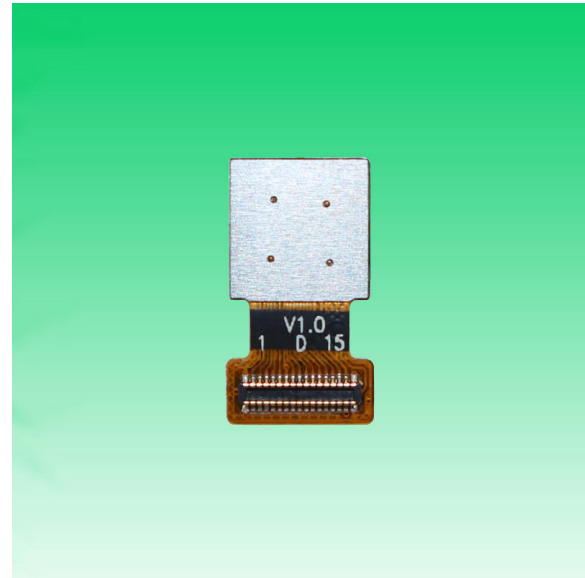## KLT-ENT-IMX214 V1.0 NIR

## 13MP Sony IMX214 MIPI Interface No IR Auto Focus Camera Module



Front View



Back View

### Specifications
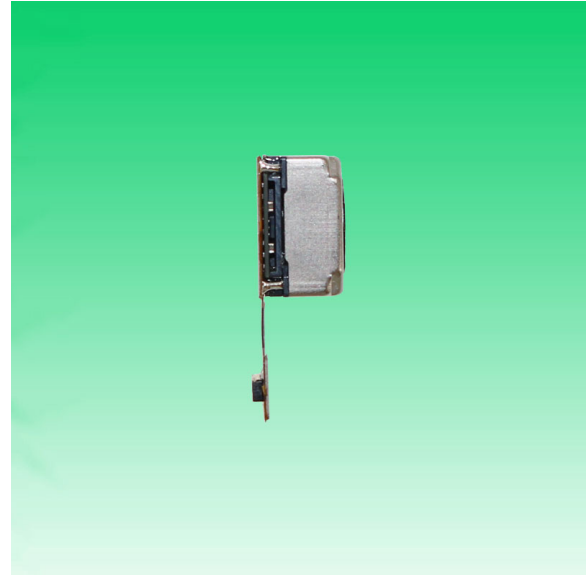
| Camera Module No. | KLT-ENT-IMX214 V1.0 NIR |
|---|---|
| Resolution | 13MP |
| Image Sensor | IMX214 |
| Sensor Type | 1/3.06" |
| Pixel Size | 1.12 um x 1.12 um |
| EFL | 3.85 mm |
| F.NO | 2.20 |
| Pixel | 4224 x 3136 |
| View Angle | 74.4°(DFOV)  62.7°(HFOV)  48.7°(VFOV) |
| Lens Dimensions | 8.50 x 8.50 x 5.60 mm |
| Module Size | 16.07 x 9.00 mm |
| Module Type | Auto Focus |
| Interface | MIPI |
| Auto Focus VCM Driver IC | FP5510 |
| Lens Type | No IR Filter Lens |
| Operating Temperature | -20°C to +70°C |
| Mating Connector | BM20B(0.8)-30DS-0.4V(51) |

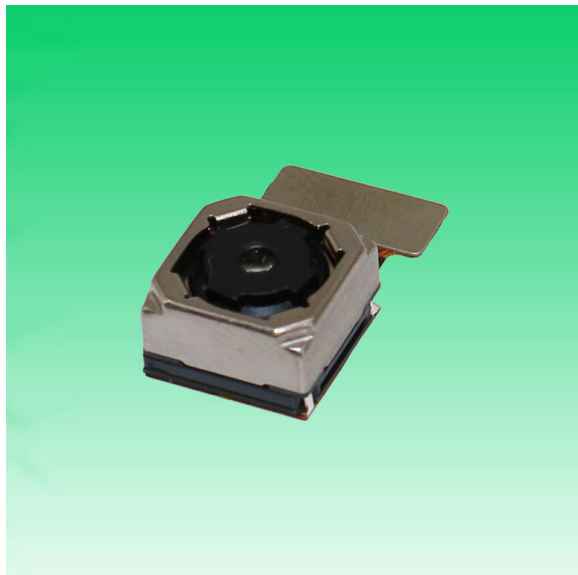## KLT-ENT-IMX214 V1.0 NIR
## 13MP Sony IMX214 MIPI Interface No IR Auto Focus Camera Module
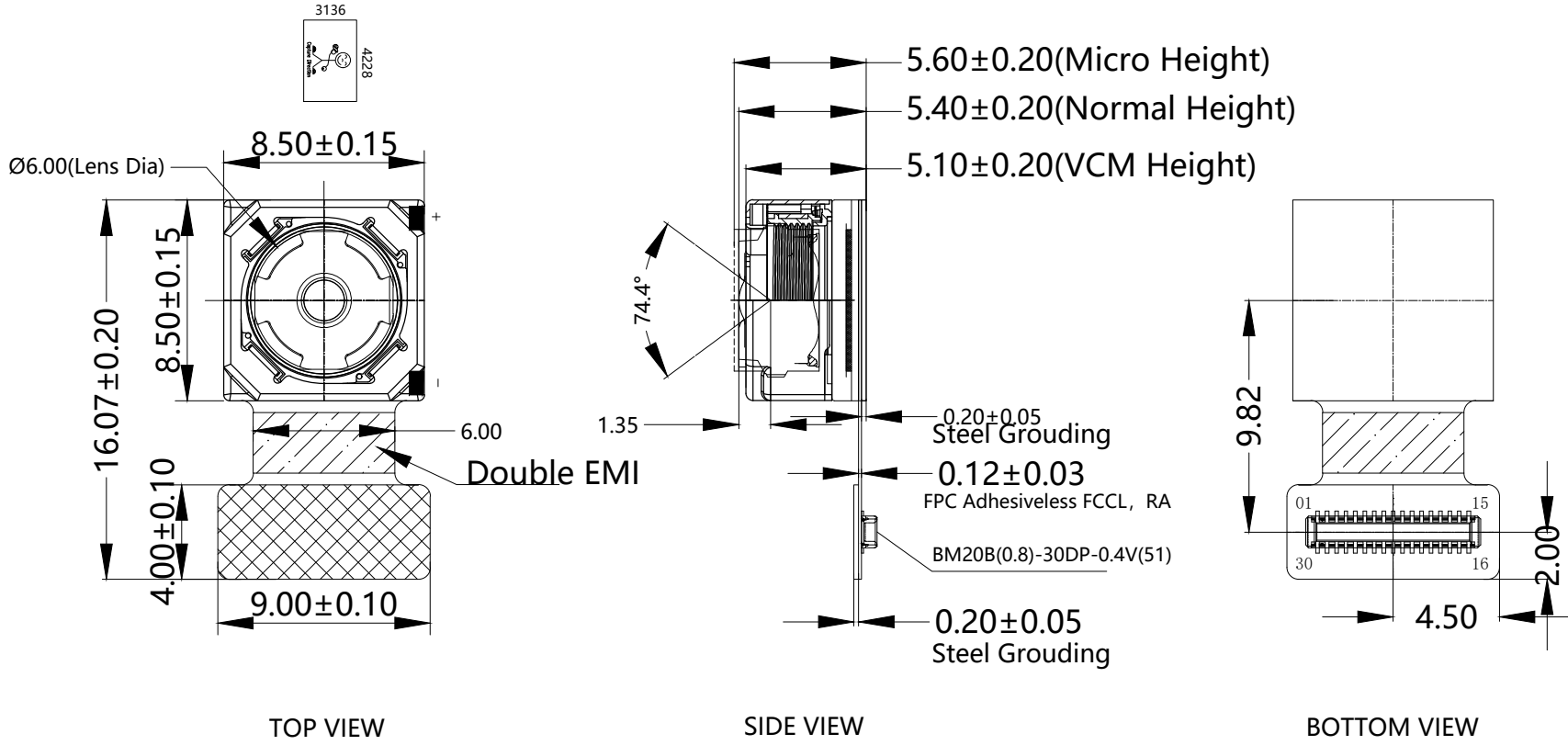


Top View



Side View



Bottom View



Mating Connector

| | A | B | C | D | E |
|---|---|---|---|---|---|
| | | | | Version | Information | Date |
| | | | | V1.0 | First Version | 2-4-2023 |

| 1 | MDN1 |
|---|---|
| 2 | MDP1 |
| 3 | DGND |
| 4 | MDN3 |
| 5 | MDP3 |
| 6 | DGND |
| 7 | MDN0 |
| 8 | MDP0 |
| 9 | DGND |
| 10 | MDN2 |
| 11 | MDP2 |
| 12 | DGND |
| 13 | MCN |
| 14 | MCP |
| 15 | AGND |
| 16 | AF_VDD 2.8V |
| 17 | AVDD 2.8V |
| 18 | DVDD 1.05V |
| 19 | DOVDD 1.8V |
| 20 | NC |
| 21 | XCLK |
| 22 | NC |
| 23 | NC |
| 24 | SCL |
| 25 | SDA |
| 26 | RESET |
| 27 | NC |
| 28 | NC |
| 29 | NC |
| 30 | NC |

**TOP VIEW**

Ø6.00(Lens Dia)
8.50±0.15
8.50±0.15
16.07±0.20
4.00±0.10
6.00
Double EMI
9.00±0.10

**SIDE VIEW**

5.60±0.20(Micro Height)
5.40±0.20(Normal Height)
5.10±0.20(VCM Height)
74.4°
1.35
0.20±0.05 Steel Grouding
0.12±0.03
FPC Adhesiveless FCCL, RA
BM20B(0.8)-30DP-0.4V(51)
0.20±0.05
Steel Grouding

**BOTTOM VIEW**

9.82
01   15
30   16
2.00
4.50

NOTE:
1.The device slave address:0x20;

Parameters:
1、Sensor specification:
Image Sensor: IMX214
Pixel: 1.12um*1.12um
Lens Type: 1/3.06
Important Voltage Description:
DVDD1.0V (external power supply);

2、Lens specification:
FOV: 74.4°(D);62.7°(H);48.7°(V);
F/NO.: 2.2±5%
TV distortion: <1.5%
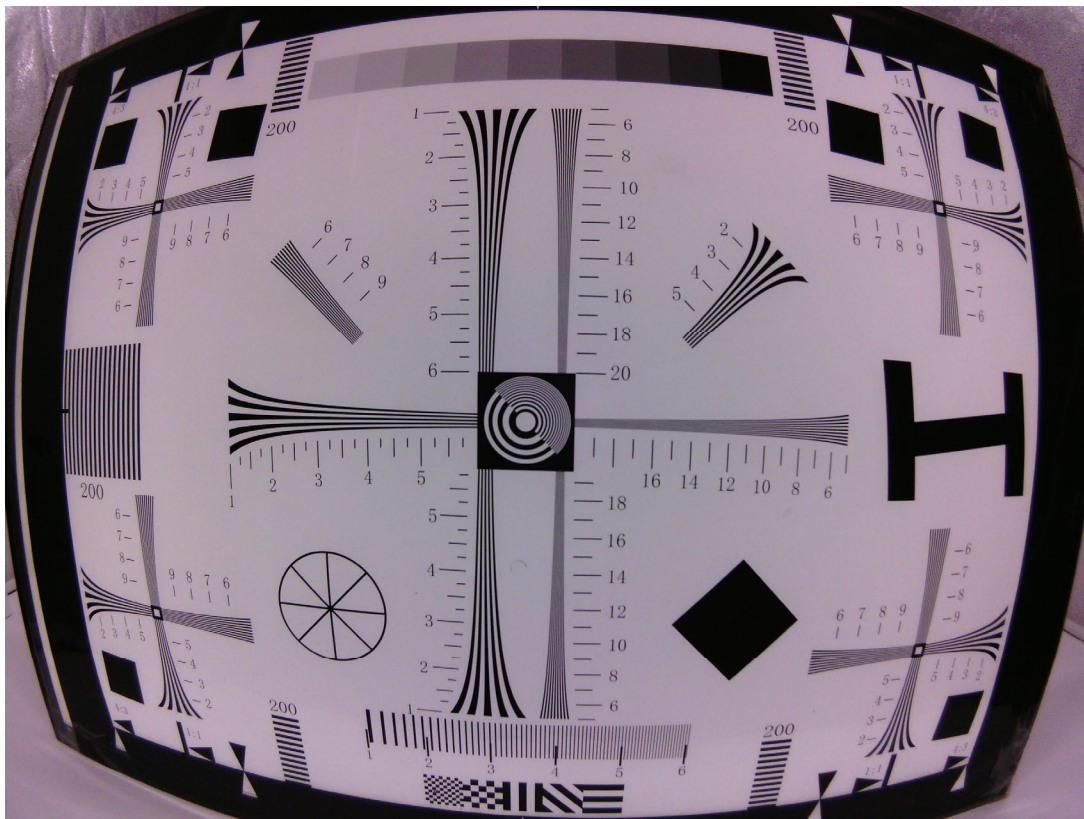Focal length: 3.81mm
Composition: 5P(NO IR FILTER)

# Kai Lap Technologies Group Ltd

| Designed By | Kevin | Model Name: | KLT-ENT-IMX214 V1.0 NIR |
|---|---|---|---|
| Checked By | Aouly_Yan | Projection Type: Third Angle | Unit: mm / Material: ____ |
| | | | Scale: 1:1 / Sheet: 1 of 1 / Version: 1/0 |

# Real Test Images
## ENT-IMX214 V1.0 NIR

# Real Test Images
## ENT-IMX214 V1.0 NIR

# Real Test Images
## ENT-IMX214 V1.0 NIR

# SONY
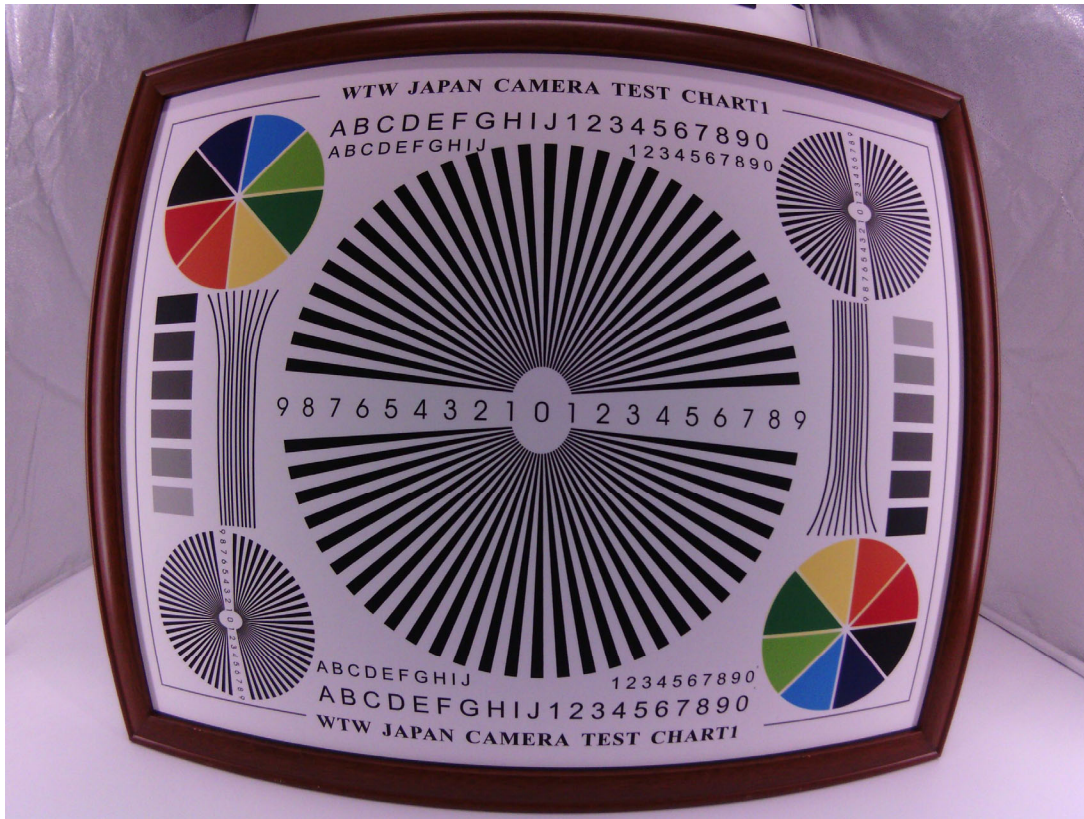
# [Product Brief]

Ver.1.0

# IMX214

## Diagonal 5.867mm (Type 1/3.06) 13M Pixel CMOS Image Sensor with Square Pixel for Color Cameras

### Description

IMX214 is a diagonal 5.867mm(Type 1/3.06) 13M pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Exmor RS™ technology to achieve high speed image capturing by column parallel A/D converter circuits and high sensitivity and low noise image (comparing with conventional CMOS image sensor) through the backside illuminated imaging pixel structure. R, G, and B pigment primary color mosaic filter is employed. By introducing spacially varying exposure technology, high dynamic range still pictures and movies are achievable. It equips an electronic shutter with variable integration time. It operates with three power supply voltages: analog 2.7 V, digital 1.0V and 1.8 V for input/output interface and achieves low power consumption.
IMX214 is designed for use in cellular phones or tablet devices*.

.

### Functions and Features

- ◆ Back illuminated and stacked CMOS image sensor Exmor RS
- ◆ Single Frame High Dynamic Range (HDR) with equivalent full pixels.
- ◆ High signal to noise ratio (SNR).
- ◆ Full resolution @30fps (Nornmal / HDR).4K2K @30fps (Normal / HDR)1080p @60fps (Normal / HDR)
- ◆ Output video format of RAW10/8, COMP8/6
- ◆ Pixel binning readout and H/V sub sampling function
- ◆ Advanced Noise Reduction (Chroma noise reduction and luminance noise reduction)
- ◆ Independent flipping and mirroring.
- ◆ CSI 2 serial data output (MIPI 2lane/4lane, Max. 1.2Gbps/lane, DPHY spec. ver. 1.1 compliant)
- ◆ 2wire serial communication
- ◆ Two PLLs for independent clock generation for pixel control and data output interface.
- ◆ Advanced Noise Reduction.
- ◆ Dynamic Defect Pixel Correction.
- ◆ Zero shutter lag.
- ◆ Power on reset function
- ◆ Dual sensor synchronization operation.
- ◆ 8K bit of OTP ROM for users.
- ◆ Built in temperature sensor

NOTE)
1. When using this product for another application, Sony does not guarantee the quality and reliability of product. Therefore, don't use this for applications other than cellular phone and Tablet PCs. Consult your Sony sales representative if you have any questions.

## Device Structure

◆ CMOS image sensor

◆ Image size                               : Diagonal 5.867mm (Type 1/3.06)

◆ Total number of pixels              : 4224 (H) ×3200(V) approx. 13.51M pixels

◆ Number of effective pixels        : 4224 (H) ×3136 (V)approx. 13.25 M pixels

◆ Number of active pixels            : 4208 (H) ×3120 (V) approx. 13.13 M pixels

◆ Chip size                                 : 6.100mm (H) × 4.524mm (V)

◆ Unit cell size                           : 1.12 μm (H) × 1.12 μm (V)

◆ Substrate material                   : Silicon

## Functional Description

### System Outline

IMX214 is a CMOS active pixel type image sensor which adopts the Exmor RS ™ technology to achieve high sensitivity, low noise and high speed image capturing. It is embedded with backside illuminated imaging pixel, low noise analog amplifier,
column parallel A/D converters which enables high speed capturing, digital amplifier, image binning circuit, timing control circuit for imaging size and frame rate, CSI2 image data high speed serial interface, PLL oscillator, and serial communication interface to control these functions.
Several additional image processing functions and peripheral circuits are also included for easy system optimization by the users. A one time programmable memory is embedded in the chip for storing the user data. It has 8 K-bit for users, 10 K-bit as a whole.

**Block Diagram**
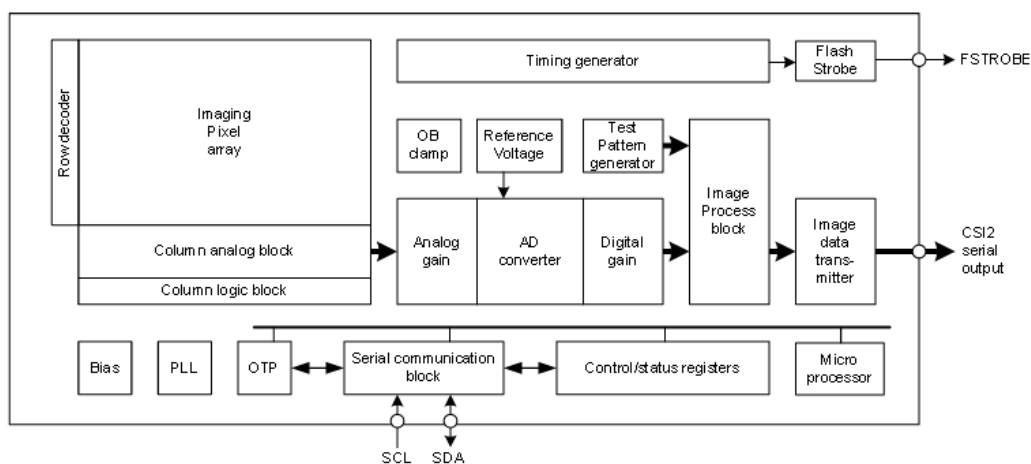


**Exmor RS**

\* Exmor RS is a trademark of Sony Corporation. The Exmor RS is a Sony's CMOS image sensor with high-resolution, high-performance and compact size by replacing a supporting substrate in Exmor R™ which changed fundamental structure of Exmor™ pixel adopted column parallel A/D converter to back-illuminated type, with layered chips formed signal processing circuits.

## *10-Bit DAC 120mA VCM Driver with I²C Interface*

## Description

The FP5510 is a single 10-bit DAC with 120mA output current voice coil motor (VCM) driver, with an I²C-compatible serial interface that operates at clock rates up to 400kHz. Its supply operates from 2.3V to 3.6V.

The FP5510 incorporates with a power-on reset circuit, power-down function. Power-on reset circuit ensure when supply power up, DAC output is to 0V until valid write bit value takes place. In power down mode, the supply current is about 1µA.

The FP5510 is designed for auto focus operation includes digital camera module, optical zoom camera phones and lens auto focus. The I²C address of FP5510 is 0x18h.

The FP5510 with WLCSP package which it is suitable for reduced-space mounting in mobile phone and other portable applications.
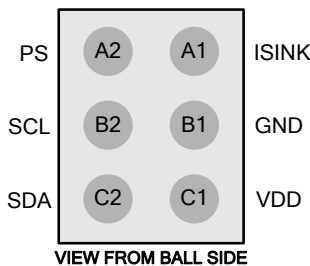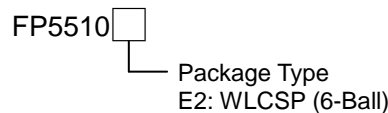
## Features

- Power Supply Voltage Rang: 2.3V to 3.6V
- VCM Driver for Auto-Focus
- 10-Bit Resolution Current Sinking of 120mA for VCM
- 2-Wire I²C Interface (1.8V Interface Compatible)
- Internal 4 Slope Control Mechanism
  1. Enhance Slope Control Mode
  2. One Step Mode
  3. Linear Slope Mode
  4. Two Step Slope Mode
- Power-Save Mode Current < 1µA
- Power On Reset (POR)
- Small Size: 0.7mm×1.1mm (6-Balls WLCSP)

## Applications

- Digital Camera Module
- Cell Phone
- Lens Cover
- Web Camera

## Pin Assignments

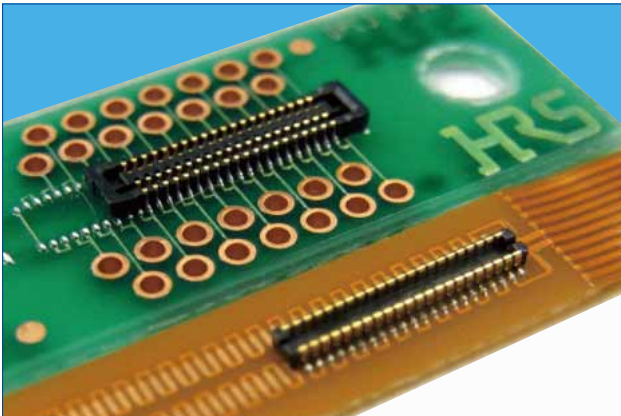**6-Ball WLCSP**



Figure 1. Pin Assignment of FP5510

## Ordering Information

FP5510☐

Package Type
E2: WLCSP (6-Ball)

**WLCSP-6 (0.7mmx1.1mm) Marking**

| Part Number | Product Code |
|---|---|
| FP5510E2 | 2 |

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

## BM20 Series

## ■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

Existing products — BM20

2.98mm
2.3mm
10.4mm
**10.48mm**
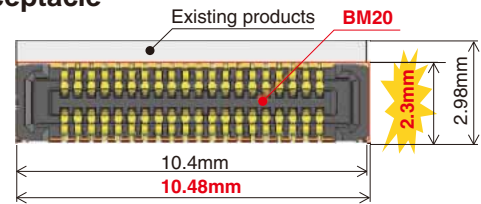
**A 22.3% reduction in size!**

| Existing products | BM20 |
|---|---|
| 2.98 × 10.4 = About 31.0mm² | 2.3 × 10.48 = About 24.1mm² |

## ■Header

Existing products — **BM20**

2.46mm
1.78 mm
9.32mm
**9.4mm**

Board occupied area
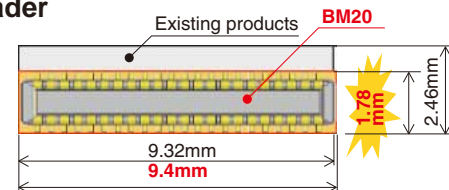
**A 27.1% reduction in size!**

| Existing products | BM20 |
|---|---|
| 2.46 × 9.32 = About 22.9mm² | 1.78 × 9.4 = About 16.7mm² |

## Vaccum pick-up

0.7    0.7
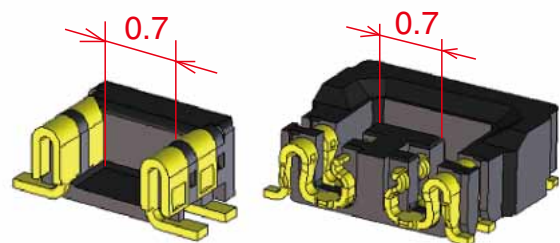
## Mating diagram (cross section)

**H=0.8**

2-point contact structure

Molded Bottom surface structure

**H=0.6**

Molded Bottom surface structure
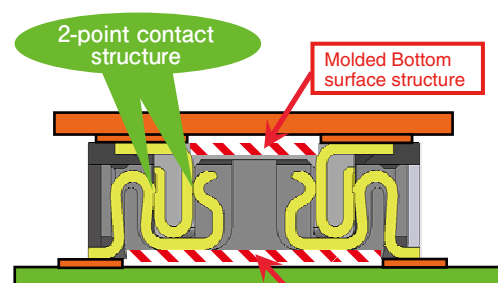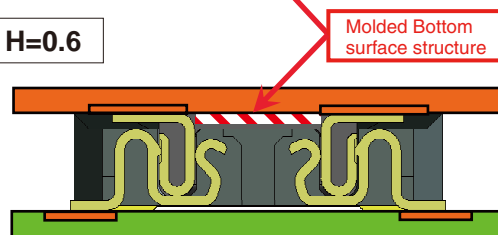
# ■Product Specifications

| 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 1$\mu$s or greater | Frequency 10-55 Hz, half amplitude 0.75mm, 3 directions for 2 hours |
| 5. Humidity Resistance | Contact resistance Maximum of 100mΩ Insulation resistance Minimum of 25mΩ | Left at temperature 40±2℃, humidity 90 to 95%, 96 hours |
| 6. Temperature Cycles | Contact resistance Maximum of 100mΩ Insulation resistance Minimum of 50mΩ | (-55℃ : 30 minutes → 5～35℃ : 10 minutes → 85℃ : 30 minutes → 5～35℃ : 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 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)**
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

| | |
|---|---|
| ❶ Series Name : BM | ❻ Connector Type DS : Double row receptacle DP : Double row header |
| ❷ Series No. : 20 | |
| ❸ Shape Symbols B : With reinforcing metal fitting | ❼ Contact Pitch : 0.4mm |
| ❹ Stack height : 0.6mm, 0.8mm | ❽ Terminal Shape V : Vertical SMT |
| ❺ No. of Contacts : Please refer to page 3 and after. | ❾ Packaging (51) : Embossed tape package (8,000 pieces per reel) |

**HRS**
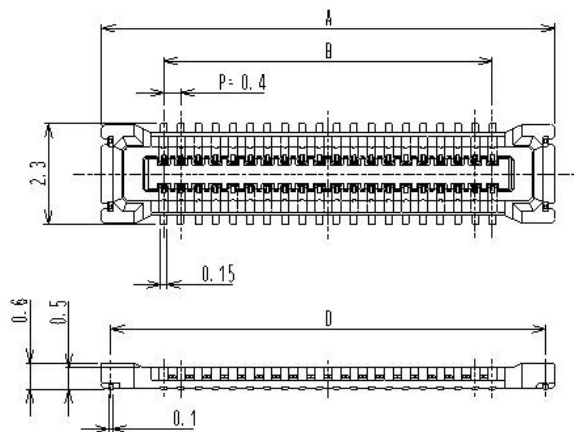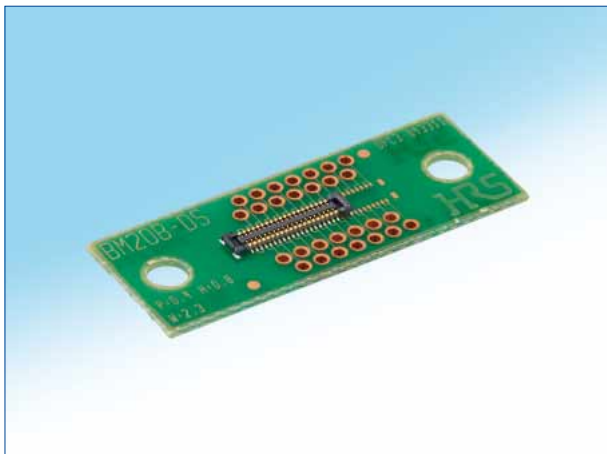
## ■H=0.6mm receptacle



## ■H=0.8mm receptacle
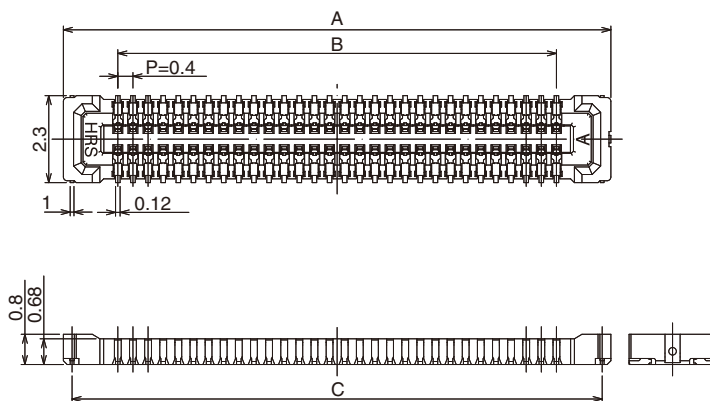


## ◆Recommended PCB layout【H= 0.6mm】



Resist coating area

## ◆Recommended PCB layout【H= 0.8mm】

◆**Recommended metal mask size (Mask thickness 100 μm)【0.6 mm and 0.8 mm common】**
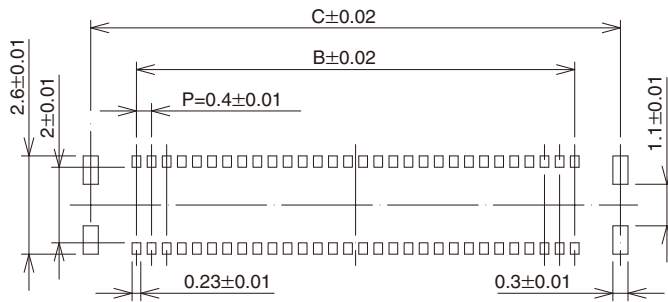


Unit : mm

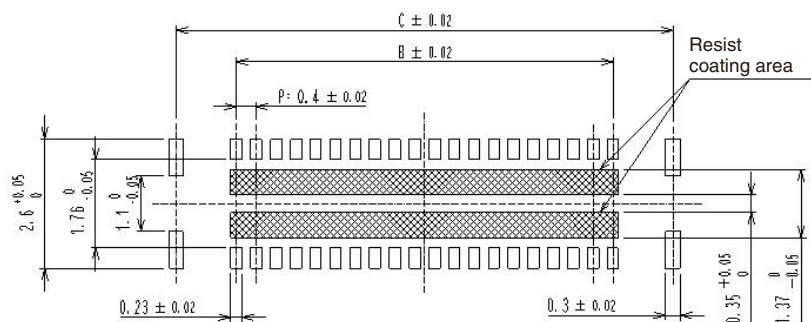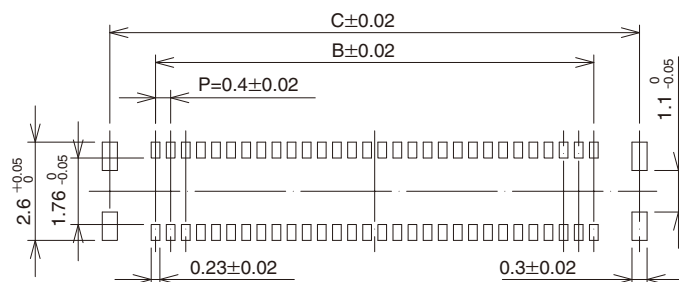| Part No. | HRS No. | No. of Contacts | A | B | C | D |
|---|---|---|---|---|---|---|
| BM20B(0.6)-10DS-0.4V(51) | 0684-9308-8 51 | 10 | 4.48 | 1.6 | 4.02 | 4.06 |
| BM20B(0.6)-20DS-0.4V(51) | 0684-9309-0 51 | 20 | 6.48 | 3.6 | 6.02 | 6.06 |
| BM20B(0.6)-24DS-0.4V(51) | 0684-9310-0 51 | 24 | 7.28 | 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.

**KLT**

**Cameras Applications**


Automotive Driver Pilot


Live Streaming


Video Conference


Eye Tracker Biometric Detection
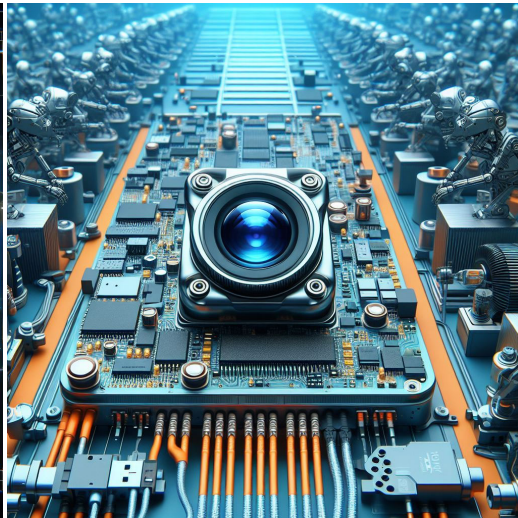

Machine Vision


Agricultural Monitor
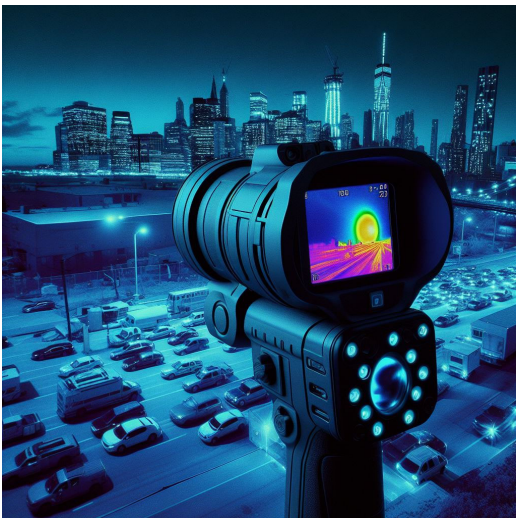

Night Vision Security


Drone and Sports Eagle Eyes


Interactive Pet Camera

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

**KLT**

*your BEST camera module partner*

**Cameras Applications**



Visible cameras
Blind-spot, side-view (mirrorless cars), accident recorder, rear park assist
Stereo cameras: direction & distance for LDWS & traffic sign recognition

IMAGING DEVICES

Long-range radar
Adaptive Cruise Control

3D cameras
Gesture recognitions presence detection, driver monitoring

Short-range radar
Front & rear parking

Night vision camera
Pedestrian / animal detection

LIDAR
3D mapping of surroundings

Dead reckoning sensors
Odometry

Ultrasound
Parking, SR pedestrian & obstacle detection

Day

Night

**Camera Module Pinout Definition Reference Chart**

| OmniVision Sony Samsung On-Semi Aptina Himax GalaxyCore PixArt SmartSens Sensors | |
|---|---|
| **Pin Signal** | **Description** |
| DGND  GND | ground for digital circuit |
| AGND | ground for analog circuit |
| PCLK  DCK | DVP PCLK output |
| XCLR  PWDN  XSHUTDOWN  STANDBY | power down active high with internal pull-down resistor |
| MCLK  XVCLK  XCLK  INCK | system input clock |
| RESET  RST | reset  active low with internal pull-up resistor |
| NC  NULL | no connect |
| SDA  SIO_D  SIOD | SCCB data |
| SCL  SIO_C  SIOC | SCCB input clock |
| VSYNC  XVS  FSYNC | DVP VSYNC output |
| HREF  XHS | DVP HREF output |
| DOVDD | power for I/O circuit |
| AFVDD | power for VCM circuit |
| AVDD | power for analog circuit |
| DVDD | power for digital circuit |
| STROBE  FSTROBE | strobe output |
| FSIN | synchronize the VSYNC signal from the other sensor |
| SID | SCCB last bit ID input |
| ILPWM | mechanical shutter output indicator |
| FREX | frame exposure / mechanical shutter |
| GPIO | general purpose inputs |
| SLASEL | I2C slave address select |
| AFEN | CEN  chip enable  active high on VCM driver IC |
| **MIPI Interface** | |
| MDN0  DN0  MD0N  DATA_N  DMO1N | MIPI 1st data lane negative output |
| MDP0  DP0  MD0P  DATA_P  DMO1P | MIPI 1st data lane positive output |
| MDN1  DN1  MD1N  DATA2_N  DMO2N | MIPI 2nd data lane negative output |
| MDP1  DP1  MD1P  DATA2_P  DMO2P | MIPI 2nd data lane positive output |
| MDN2  DN2  MD2N  DATA3_N  DMO3N | MIPI 3rd data lane negative output |
| MDP2  DP2  MD2P  DATA3_P  DMO3P | MIPI 3rd data lane positive output |
| MDN3  DN3  MD3N  DATA4_N  DMO4N | MIPI 4th data lane negative output |
| MDP3  DP3  MD3P  DATA4_P  DMO4P | MIPI 4th data lane positive output |
| MCN  CLKN  CLK_N  DCKN | MIPI clock negative output |
| MCP  CLKP  MCP  CLK_P  DCKN | MIPI clock positive output |
| **DVP Parallel Interface** | |
| D0  DO0  Y0 | DVP data output port 0 |
| D1  DO1  Y1 | DVP data output port 1 |
| D2  DO2  Y2 | DVP data output port 2 |
| D3  DO3  Y3 | DVP data output port 3 |
| D4  DO4  Y4 | DVP data output port 4 |
| D5  DO5  Y5 | DVP data output port 5 |
| D6  DO6  Y6 | DVP data output port 6 |
| D7  DO7  Y7 | DVP data output port 7 |
| D8  DO8  Y8 | DVP data output port 8 |
| D9  DO9  Y9 | DVP data output port 9 |
| D10  DO10  Y10 | DVP data output port 10 |
| D11  DO11  Y11 | DVP data output port 11 |

**Camera Reliability Test**

| Reliability Inspection Item | | Testing Method | Acceptance Criteria |
|---|---|---|---|
| Category | Item | | |
| Environmental — Storage Temperature | High 60°C 96 Hours | Temperature Chamber | No Abnormal Situation |
| | Low -20°C 96 Hours | Temperature Chamber | No Abnormal Situation |
| Operation Temperature | High 60°C 24 Hours | Temperature Chamber | No Abnormal Situation |
| | Low -20°C 24 Hours | Temperature Chamber | No Abnormal Situation |
| Humidity | 60°C 80% 24 Hours | Temperature Chamber | No Abnormal Situation |
| Thermal Shock | High 60°C 0.5 Hours Low -20°C 0.5 Hours Cycling in 24 Hours | Temperature Chamber | No Abnormal Situation |
| Physical — Drop Test (Free Falling) | Without Package 60cm | 10 Times on Wood Floor | Electrically Functional |
| | With Package 60cm | 10 Times on Wood Floor | Electrically Functional |
| Vibration Test | 50Hz X-Axis 2mm 30min | Vibration Table | Electrically Functional |
| | 50Hz Y-Axis 2mm 30min | Vibration Table | Electrically Functional |
| | 50Hz Z-Axis 2mm 30min | Vibration Table | Electrically Functional |
| Cable Tensile Strength Test | Loading Weight 4 kg 60 Seconds Cycling in 24 Hours | Tensile Testing Machine | Electrically Functional |
| Electrical — ESD Test | Contact Discharge 2 KV | ESD Testing Machine | Electrically Functional |
| | Air Discharge 4 KV | ESD Testing Machine | Electrically Functional |
| Aging Test | On/Off 30 Seconds Cycling in 24 Hours | Power Switch | Electrically Functional |
| USB Connector | On/Off 250 Times | Plug and Unplug | Electrically Functional |

# CMOS CAMERA MODULES

**Camera Inspection Standard**

| 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 |
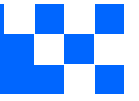
## KLT Package Solutions
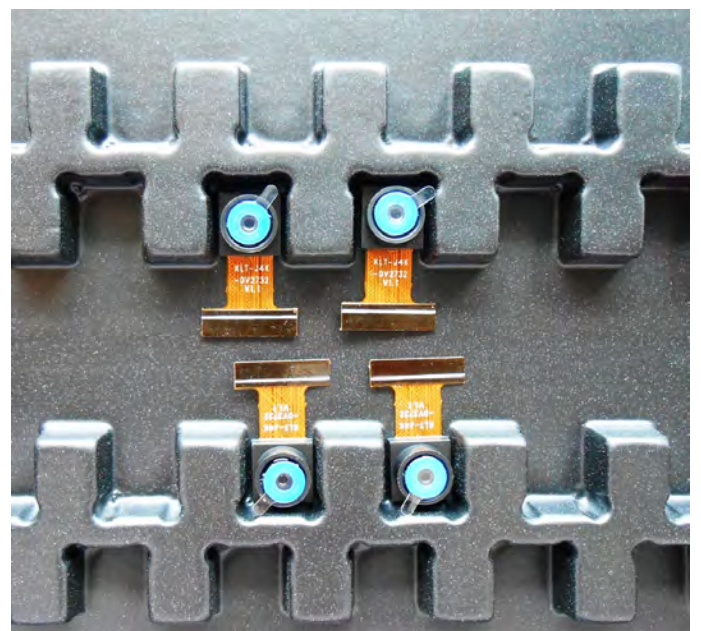
KLT Camera Module
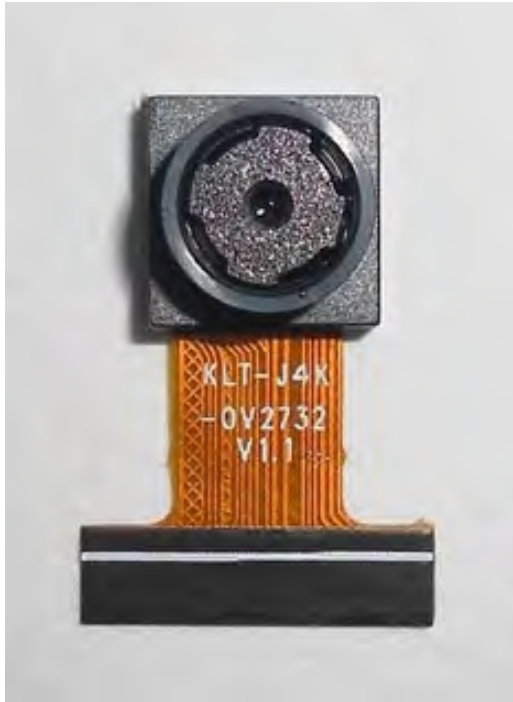


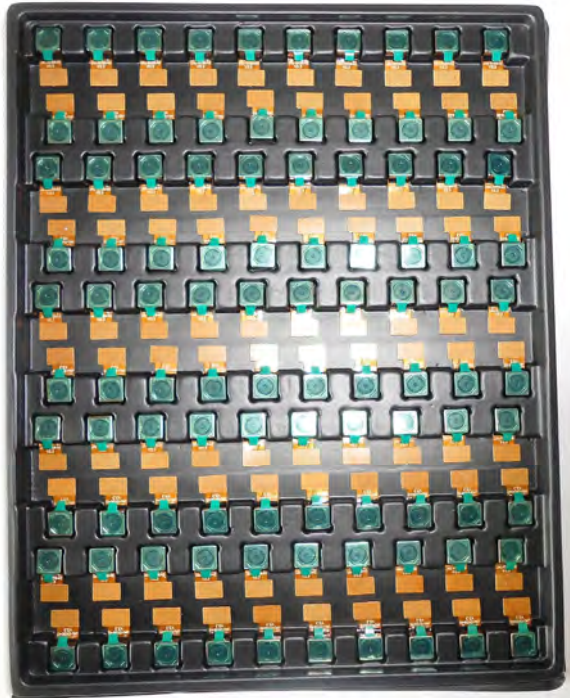Complete with Lens Protection Film



Tray with Grid and Space



Place Cameras on the Tray

**KLT**

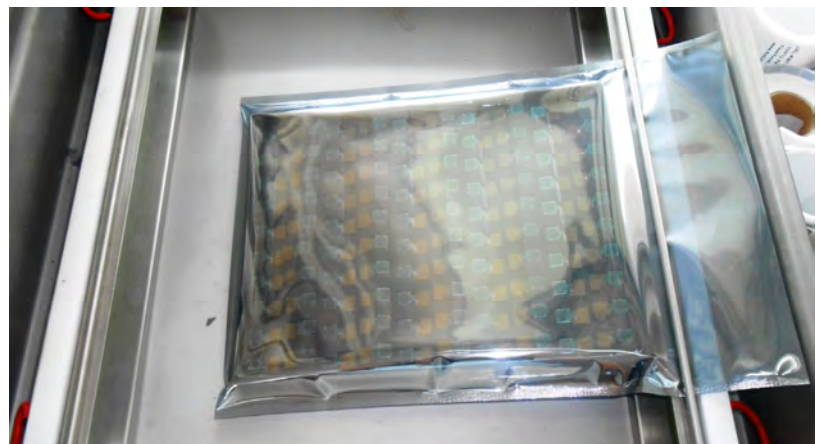## Camera Modules Package Solution

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



KLT-J4K-OV2732 V1.1
OV2732, MIPI & Parallel
Fixed Focus, 67.4 Degree
www.KaiLapTech.com

100
PIECES

Shipping Date
10  August  2017

CAUTION
STATIC SENSITIVE
DEVICES
NOT TO BE HANDLED
BY UNAUTHORISED
PERSONNEL

KLT

*your BEST camera module partner*

## 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**

# CMOS CAMERA MODULES

*your BEST camera module partner*

## 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**



KLT-J4K-OV2732 V1.1
OV2732, MIPI & Parallel
Fixed Focus, 67.4 Degree
www.KaiLapTech.com

Shipping Date
10 August 2017

**CAUTION**
STATIC SENSITIVE
DEVICES
NOT TO BE HANDLED
BY UNAUTHORISED
PERSONNEL

FH12-24S-0.5SH
Mating Connector for
KLT-J4K-OV2732 V1.0
www.KaiLapTech.com

10
PIECES

**CAUTION**
STATIC SENSITIVE
DEVICES
NOT TO BE HANDLED
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PERSONNEL

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

**KLT**

# 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.
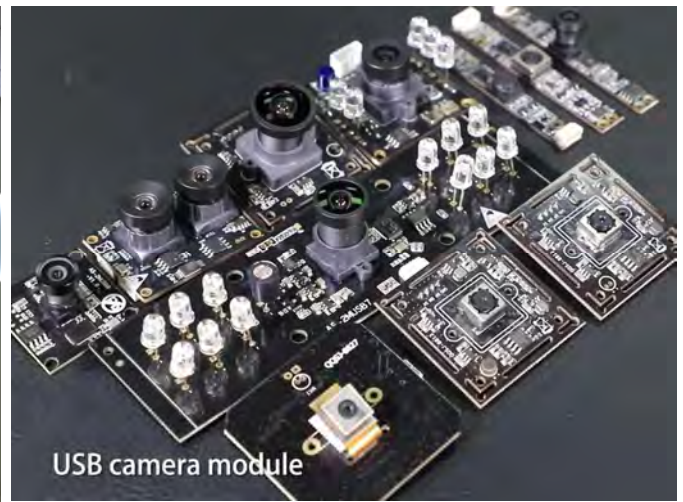


**Limited Warranty**

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 subsequential events.

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

**KLT Strength**

Powerful Factory



Professional Service



Promised Delivery