

**KLT-U8MA-OV5645 V1.0****5MP OmniVision OV5645 MIPI Interface Auto Focus Camera Module**

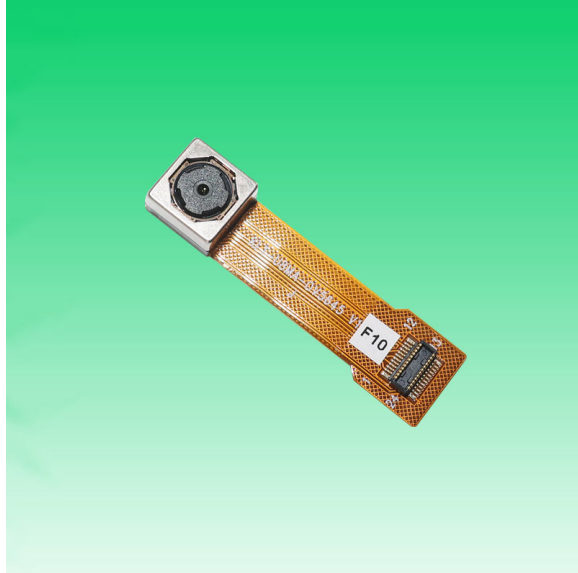
Front View



Back View

**Specifications**

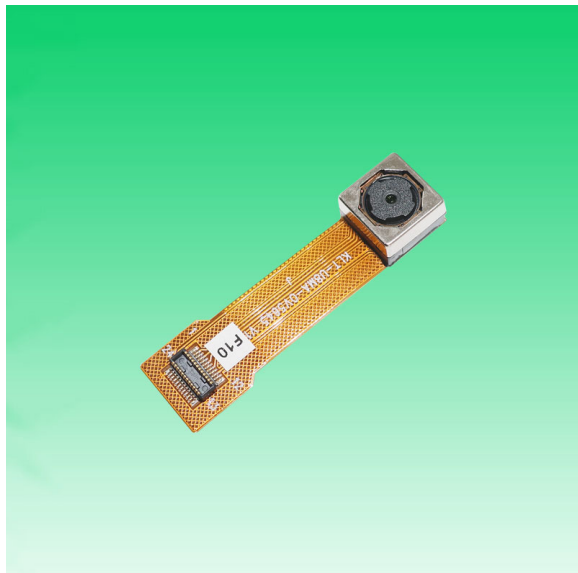
<b>Camera Module No.</b>	<b>KLT-U8MA-OV5645 V1.0</b>
<b>Resolution</b>	5MP
<b>Image Sensor</b>	OV5645
<b>Sensor Type</b>	1/4"
<b>Pixel Size</b>	1.4 $\mu\text{m}$ x 1.4 $\mu\text{m}$
<b>EFL</b>	3.29 mm
<b>F.NO</b>	2.80
<b>Pixel</b>	2592 x 1944
<b>View Angle</b>	68.7°(DFOV) 58.1°(HFOV) 45.0°(VFOV)
<b>Lens Dimensions</b>	8.50 x 8.50 x 5.07 mm
<b>Module Size</b>	36.25 x 10.00 mm
<b>Module Type</b>	Auto Focus
<b>Interface</b>	MIPI
<b>Auto Focus VCM Driver IC</b>	Embedded
<b>Lens Type</b>	650nm IR Cut
<b>Operating Temperature</b>	-30°C to +70°C
<b>Mating Connector</b>	AXK724147G

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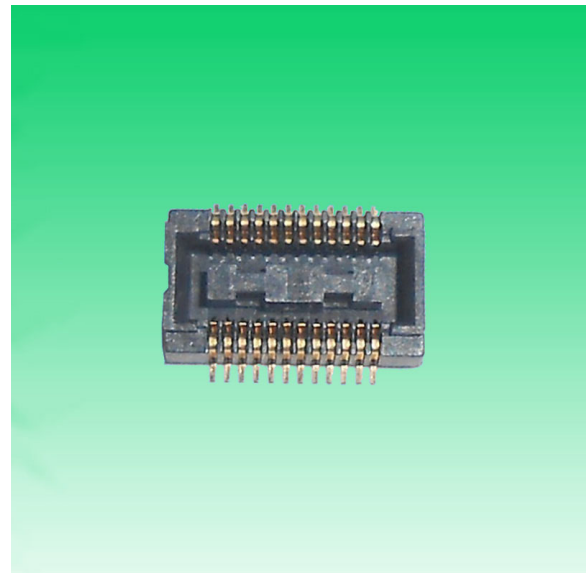
Top View



Side View





Bottom View



Mating Connector

**Periodic table of Elements**

GROUP 1 1,008 H Hydrogen

2 6,941 Li Lithium

3 9,012 Be Beryllium

4 12,011 B Boron

5 14,007 N Nitrogen

6 15,999 O Oxygen

7 18,998 F Fluorine

8 20,180 Ne Neon

9 22,990 Na Sodium

10 24,304 Mg Magnesium

11 26,981 Al Aluminum

12 28,086 Si Silicon

13 30,974 P Phosphorus

14 32,06 S Sulfur

15 35,45 Cl Chlorine

16 39,948 Ar Argon

17 39,098 K Potassium

18 40,078 Ca Calcium

19 44,956 Sc Scandium

20 47,87 Ti Titanium

21 50,942 V Vanadium

22 51,996 Cr Chromium

23 54,94 Mn Manganese

24 55,845 Fe Iron

25 58,93 Ni Nickel

26 58,69 Cu Copper

27 63,55 Zn Zinc

28 65,38 Ga Gallium

29 69,72 Ge Germanium

30 72,61 As Arsenic

31 74,92 Se Selenium

32 78,96 Br Bromine

33 83,80 Kr Krypton

34 85,47 Rb Rubidium

35 87,62 Sr Strontium

36 88,91 Y Yttrium

37 91,22 Zr Zirconium

38 92,91 Nb Niobium

39 95,94 Mo Molybdenum

40 97,90 Tc Technetium

41 101,1 Ru Ruthenium

42 102,9 Rh Rhodium

43 106,4 Pd Palladium

44 107,9 Ag Silver

45 112,4 Cd Cadmium

46 114,8 In Indium

47 118,7 Sn Tin

48 121,8 Sb Antimony

49 127,6 Te Tellurium

50 126,9 I Iodine

51 131,3 Xe Xenon

52 132,9 Cs Cesium

53 137,3 Ba Barium

54 175,10 La Lanthanum

55 178,5 Hf Hafnium

56 180,9 Ta Tantalum

57 183,8 W Tungsten

58 186,2 Re Rhenium

59 186,2 Os Osmium

60 190,2 Ir Iridium

61 195,1 Pt Platinum

62 196,9 Au Gold

63 200,6 Hg Mercury

64 204,4 Tl Thallium

65 207,2 Pb Lead

66 208,9 Bi Bismuth

67 209 Po Polonium

68 210 At Astatine

69 210 Rn Radon

70 223 Fr Francium

71 226 Ra Radium

72 227 Ac Actinium

73 227 Th Thorium

74 232 Pa Protactinium

75 238 U Uranium

76 238 Np Neptunium

77 239 Pu Plutonium

78 244 Am Americium

79 247 Cm Curium

80 251 Bk Berkelium

81 252 Cf Californium

82 252 Es Einsteinium

83 252 Fm Fermium

84 252 Md Mendelevium

85 252 No Nobelium

86 252 Lr Lawrencium

87 138,9 La Lanthanum

88 140,1 Ce Cerium

89 140,9 Pr Praseodymium

90 141,9 Nd Neodymium

91 143,9 Sm Samarium

92 150,4 Eu Europium

93 151,9 Gd Gadolinium

94 157,2 Tb Terbium

95 158,9 Dy Dysprosium

96 162,5 Ho Holmium

97 164,9 Er Erbium

98 167,2 Tm Thulium

99 168,9 Yb Ytterbium

100 173 Lu Lutetium

101 232 Th Thorium

102 232 Pa Protactinium

103 238 U Uranium

104 238 Np Neptunium

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106 244 Am Americium

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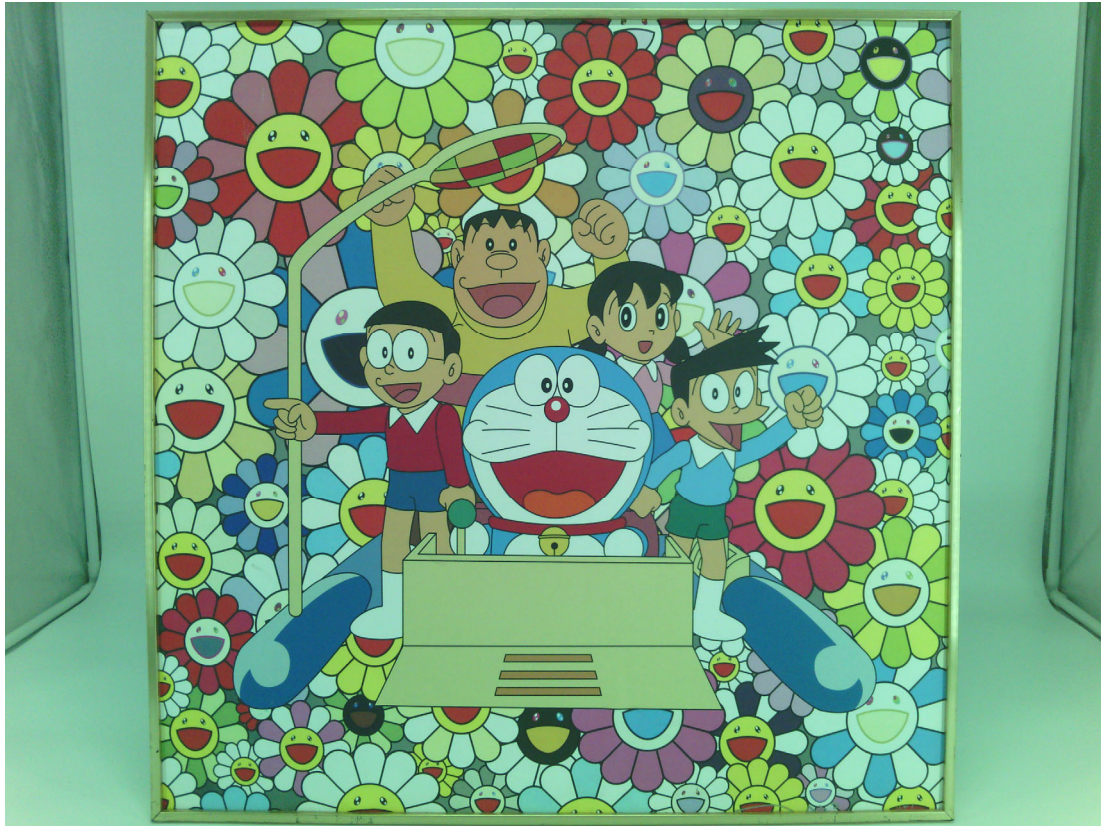
712 252 Es Einsteinium

713 252 Fm Fermium

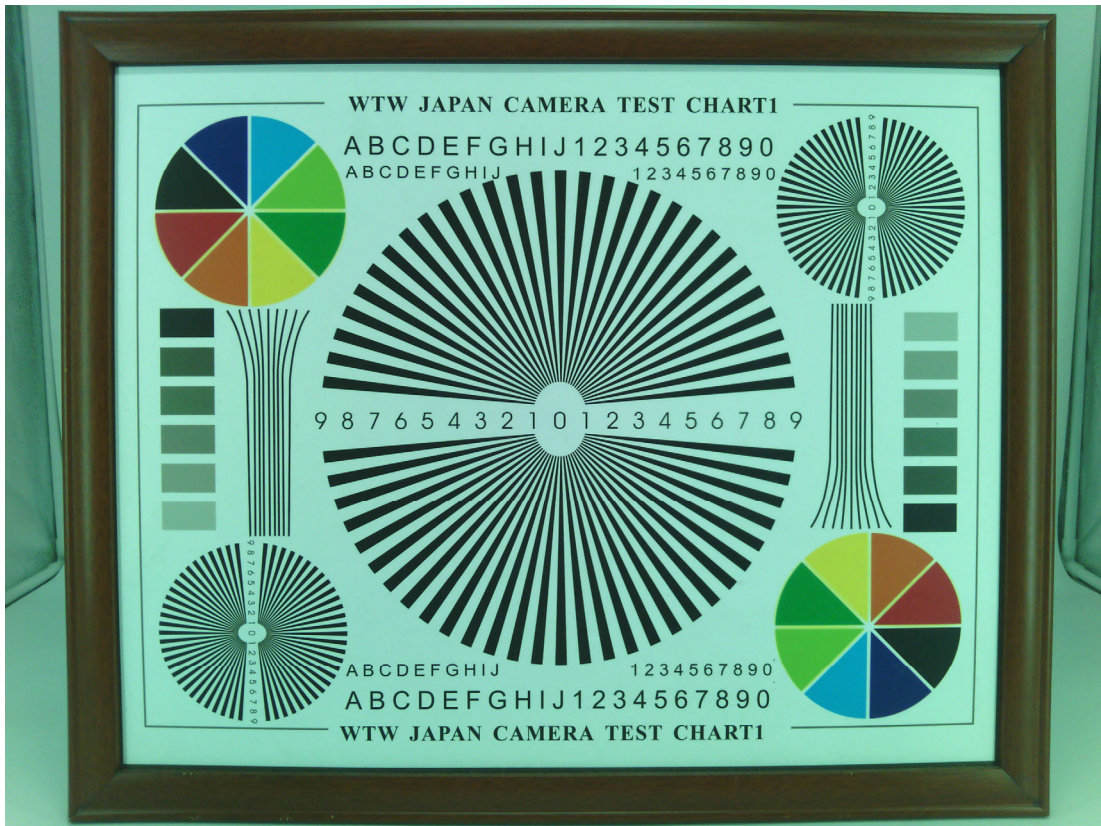
714 252 Md Mendelevium

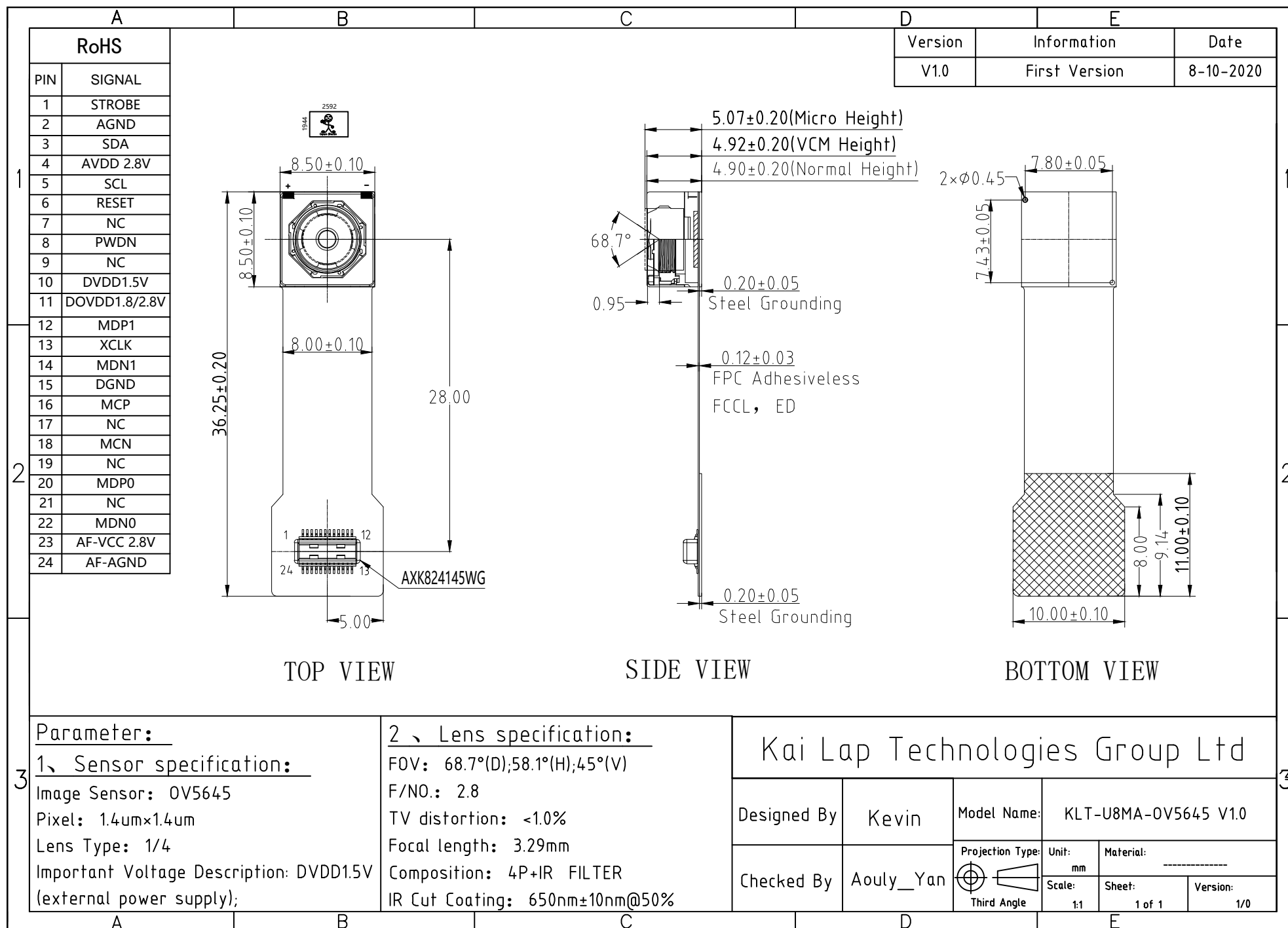
715 252 No Nobelium











Parameter:

1、Sensor specification:

Image Sensor: OV5645

Pixel: 1.4um×1.4um

Lens Type: 1/4

Important Voltage Description: DVDD1.5V  
(external power supply);

2、Lens specification:

FOV: 68.7°(D);58.1°(H);45°(V)

F/NO.: 2.8

TV distortion: <1.0%

Focal length: 3.29mm

Composition: 4P+IR FILTER

IR Cut Coating: 650nm±10nm@50%

Kai Lap Technologies Group Ltd

Designed By

Kevin

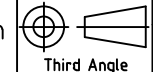
Model Name:

KLT-U8MA-OV5645 V1.0

Checked By

Aouly\_Yan

Projection Type:



Unit:

mm

Scale:

1:1

Material:

\_\_\_\_\_

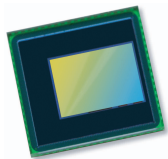
Sheet:

1 of 1

Version:

1/0





# OV5645 5-megapixel product brief



available in  
a lead-free  
package

## High Quality 5-Megapixel Photography and HD Video for Low-Cost Mobile Devices

OmniVision's OV5645 is a high performance, 5-megapixel system-on-chip (SOC) ideally suited for the cost-sensitive segment of the mobile handset market. The CameraChip™ sensor's single MIPI port replaces both a bandwidth-limited DVP interface and a costly embedded JPEG compressor, allowing the new OV5645 sensor to save significant silicon area and cost. An embedded autofocus control with voice coil motor driver offers further cost savings for the end user, making the OV5645 a highly attractive alternative to other 5-megapixel sensors currently on the market.

The OV5645 also features a new picture-in-picture (PIP) architecture that offers an easy-to-implement, low-cost dual camera system solution for mobile handsets and smartphones. The feature is based on a master/slave configuration where a front-facing camera (OV7965) can be connected through the OV5645 master camera, enabling a two-camera system with PIP functionality without the need for an additional MIPI interface into the baseband processor.

Built on OmniVision's 1.4-micron OmniBSI™ pixel architecture, the OV5645 offers high performance 5-megapixel photography and 720p HD video at 60 frames per second (FPS) and 1080p HD video at 30 FPS with complete user control over formatting and output data transfer. The sensor's 720p HD video is captured in full field-of-view with 2 x 2 binning, which doubles the sensitivity and improves the signal-to-noise ratio (SNR). A unique post-binning, re-sampling filter function removes zigzag artifacts around slant edges and minimizes spatial artifacts to deliver even sharper, crisper color images.

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

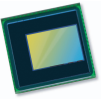
## Applications

- Cellular Phones
- PC Multimedia
- Toys
- Digital Still Cameras

## Product Features

- 1.4  $\mu\text{m}$  x 1.4  $\mu\text{m}$  pixel with OmniBSI™ technology for high performance (high sensitivity, low crosstalk, low noise, improved quantum efficiency)
- optical size of 1/4"
- automatic image control functions: automatic exposure control (AEC), automatic white balance (AWB), automatic band filter (ABF), automatic 50/60 Hz luminance detection, and automatic blacklevel calibration (ABLC)
- image quality controls: color saturation, hue, gamma, sharpness (edge enhancement), lens correction, defective pixel canceling, and noise canceling
- support for output formats: RAW RGB, RGB565/555/444, YUV422/420, YCbCr422
- support for video or snapshot operations
- support for internal and external frame synchronization for frame exposure mode
- support for LED and flash strobe mode
- support for horizontal and vertical sub-sampling, binning
- support for minimizing artifacts on binned image
- support for data compression output
- support for anti-shake
- standard serial SCCB interface
- dual lane MIPI output interface
- embedded 1.5V regulator for core power
- programmable I/O drive capability, I/O tri-state configurability
- support for black sun cancellation
- support for images sizes: 5 megapixel, and any arbitrary size scaling down from 5 megapixel
- support for auto focus control (AFC) with embedded AF VCM driver
- embedded microcontroller
- suitable for module size of 8.5 x 8.5 x <6mm with both CSP and RW packaging

# OV5645



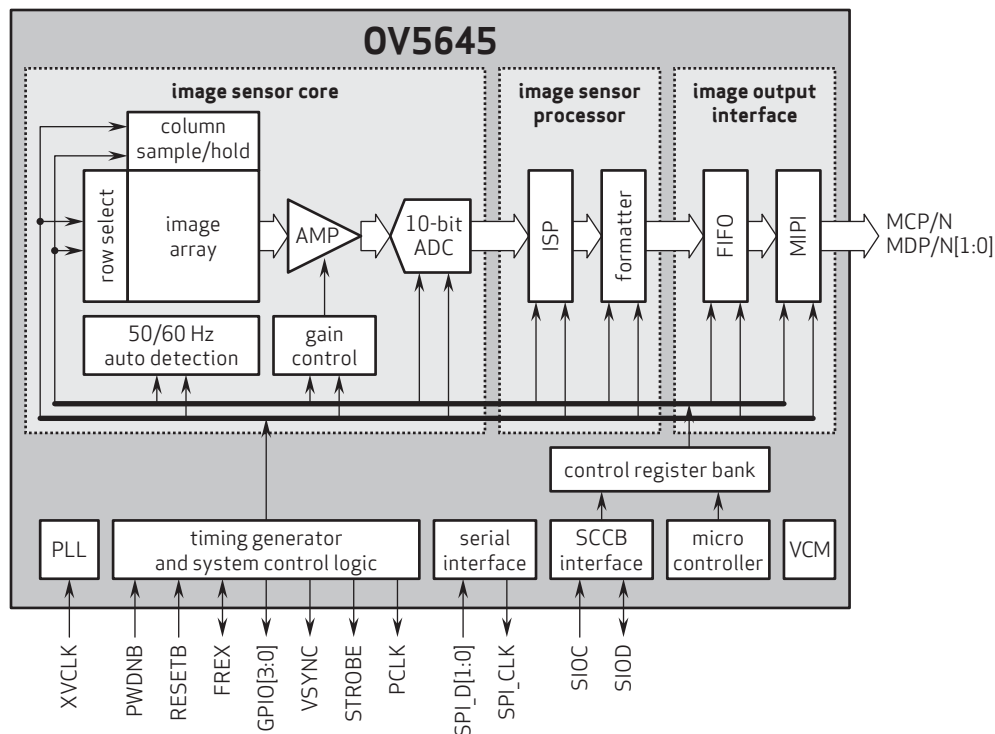
## Ordering Information

- OV5645-A66A (color, lead-free, 66-pin CSP3)
- OV5645-G04A (color, chip probing, 200  $\mu\text{m}$  backgrinding, reconstructed wafer)

## Product Specifications

- active array size: 2592 x 1944
- power supply:
  - core: 1.5V  $\pm$ 5% (with embedded 1.5 regulator)
  - analog: 2.6 - 3.0V (2.8V typical)
  - I/O: 1.8V / 2.8V
- temperature range:
  - operating: -30°C to 70°C junction temperature
  - stable image: 0°C to 50°C junction temperature
- output formats: 8-/10-bit RGB RAW, RGB565/555/444, YUV422/420, YCbCr422 output
- lens size: 1/4"
- lens chief ray angle: 29.1°
- input clock frequency: 6 - 27 MHz
- max S/N ratio: 36 dB
- maximum image transfer rate:
  - QSGA (2592x1944): 15 fps
  - 1080p: 30 fps
  - 1280x960: 45 fps
  - 720p: 60 fps
- shutter: rolling shutter / frame exposure
- maximum exposure interval: 1964 x t<sub>row</sub>
- pixel size: 1.4  $\mu\text{m}$  x 1.4  $\mu\text{m}$
- image area: 3673.6  $\mu\text{m}$  x 2738.4  $\mu\text{m}$
- package/die dimensions:
  - CSP3: 6200  $\mu\text{m}$  x 4860  $\mu\text{m}$
  - COB: 6190  $\mu\text{m}$  x 4850  $\mu\text{m}$

## Functional Block Diagram



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**OmniVision**



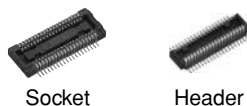
**Panasonic**  
ideas for life

## NARROW-PITCH CONNECTORS FOR BOARD-TO-BOARD AND BOARD-TO-FPC CONNECTION

## NARROW PITCH (0.4mm) CONNECTORS P4 SERIES



### • Without retention fitting



### • With retention fitting

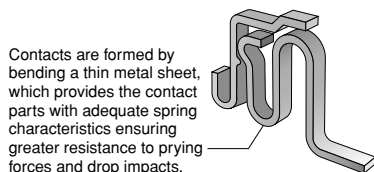


## FEATURES

1. 0.4 mm pitch and support for mated heights of up to 1.5 mm, 2.0 mm, 2.5 mm, 3.0 mm, 3.5 mm, and 4.0 mm.

2. Strong resistance to adverse environments! Utilizes **TOUGH CONTACT** construction for high contact reliability.

1) Contacts are highly resistant to shock caused by dropping and employ our original bellows contact construction.

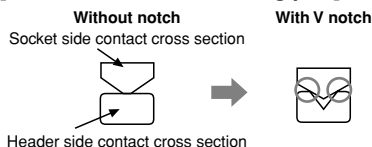


2) V notch construction used for excellent resistance against foreign matters.

### ● What is V notch construction?

By using the edge for the contacting part and increasing contact pressure per unit area, the effectiveness in removing flux and contaminants is increased compared to its predecessor. This is also effective in preventing the trapping of contaminants.

#### [Cross section of contacting part]

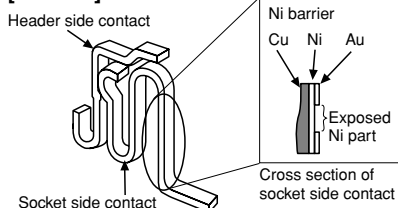


3) Use of Ni barrier construction is standard. Highly effective against solder creeping.

### ● What is Ni barrier construction?

By providing an exposed nickel part on the gold (Au) plated contact, solder creeping is prevented despite the ultra low profile.

#### [Contact]

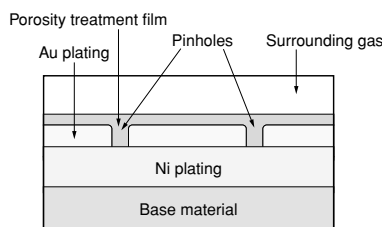


Note: Construction makes solder creeping difficult because header side is formed at the same time.

4) Porosity treatment applied for improved resistance against corrosion.

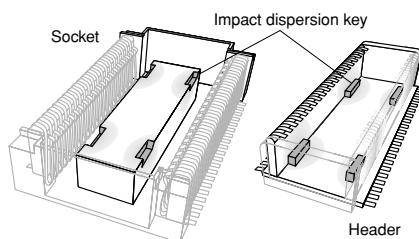
### What is porosity treatment?

This treatment consists of coating the surface with a very thin film to seal pinholes in the gold plating. This porosity treatment technology ensures the same contact reliability for thin gold plating as that of thick gold plating.



- Improvement in insertion/removal durability
- Improvement in resistance to corrosion
- Improvement in contact reliability for digital signals

3. It is constructed with impact dispersion keys inside the body to disperse shocks when dropped.



A high level of shock resistance is ensured by dispersing impact over the four locations where the socket indentations and header protrusions are mated together.

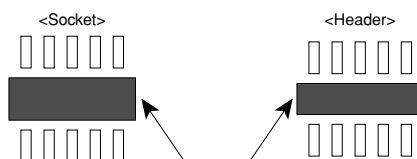
Note: The following numbers of contacts are not supported due to suction surface factors.

• Without retention fitting: 18 contacts or less

• With retention fitting: 22 contacts or less

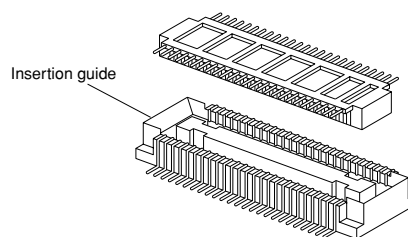
4. Construction makes designing devices easier.

1) The lower connector bottom surface construction prevents contact and shorts between the PCB and metal terminals. This enables freedom in pattern wiring, helping to make PCB's smaller.



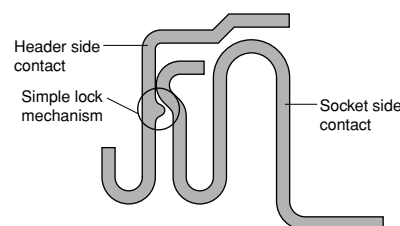
Connector bottom: Create any thru-hole and pattern wiring.

2) Guides are provided to take up any position shift and facilitate insertion.



3) The connector has a simple lock mechanism.

Superior mated operation with click feel to indicate that mated is complete.



5. Design makes efficient mounting.

Features a terminal flatness of 0.08 mm, construction resistant to creeping flux, and design that facilitates visual inspection of the soldered part.

6. Compliance with RoHS Directive

Environmentally friendly, the connectors comply with Europe's RoHS Directive. Cadmium, lead, mercury, hexavalent chromium, PBB and PBDE are not used.

7. Connectors for inspection available

Connectors for inspection are available that are ideal for modular unit inspection and inspection in device assembly processes.

# APPLICATIONS

Compact portable devices “Cellular phones, DVC, Digital cameras, etc”

**Ideal for Board-to-FPC connections**

**Before mating**

**After mating**

FPC Reinforcing plate  
Narrow-pitch connectors P4 PCB

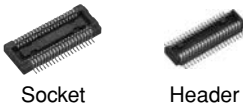
1.5mm

The simple lock mechanism ensures that the connector clicks into position when it is inserted for reliable single-action insertion on the PCB.

This enables the number of pins to be doubled while the size remains the same as that for existing FPC connectors. This, in turn, contributes to making products and equipment more compact.

## TABLE OF PRODUCT TYPES

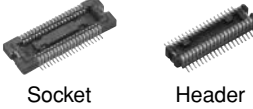
P4 (0.4 mm pitch): Without retention fitting



☆: Available for sale

Mated height		1.5mm	2.0mm	2.5mm	3.0mm	3.5mm	4.0mm
Number of contacts	14	☆	☆	☆			
	16	☆					
	20	☆	☆	☆			
	22	☆					
	24	☆	☆	☆			
	26	☆	☆				
	28	☆					
	30	☆	☆	☆			
	34	☆	☆				
	36	☆					
	40	☆	☆	☆			
	44	☆		☆			
	50	☆	☆	☆			
	54	☆					
	60	☆		☆			
	64	☆					
	70	☆	☆	☆			
	80	☆	☆				
	90	☆		☆			
	100	☆	☆	☆			

P4 (0.4 mm pitch): With retention fitting



☆: Available for sale

Mated height		1.5mm	2.0mm	2.5mm	3.0mm	3.5mm	4.0mm
Number of contacts	10	☆					
	12	☆					
	20			☆	☆	☆	
	22	☆					
	24		☆				
	28	☆					
	30	☆					
	32			☆			
	34	☆					☆
	40	☆		☆	☆		
	44	☆					
	46	☆					
	50	☆		☆	☆	☆	☆
	60	☆		☆	☆	☆	
	80	☆	☆	☆	☆	☆	☆
	90	☆		☆	☆		
	100	☆					

Note: Please contact us regarding numbers of contacts other than those given above.

# AXK7, 8

## ORDERING INFORMATION

	AXK	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
7: Narrow Pitch Connector P4 (0.4 mm pitch) Socket								
8: Narrow Pitch Connector P4 (0.4 mm pitch) Header								
Number of contacts (2 digits)								
Mated height								
<Socket>								
1: For mated height 1.5 mm								
2: For mated height 2.0 mm								
3: For mated height 2.5 mm and 3.0 mm								
4: For mated height 3.5 mm								
5: For mated height 4.0 mm								
<Header>								
1: For mated height 1.5 mm, 2.0 mm and 2.5 mm								
2: For mated height 3.0 mm, 3.5 mm and 4.0 mm								
Functions								
1: With retention fitting, with positioning bosses								
2: With retention fitting, without positioning bosses								
3: Without retention fitting, with positioning bosses								
4: Without retention fitting, without positioning bosses								
Surface treatment (Contact portion / Terminal portion)								
<Socket>								
5: Ni plating on base, Au plating on surface								
7: Ni plating on base, Au plating on surface (for Ni barrier product available)								
<Header>								
5: Ni plating on base, Au plating on surface								
Other specifications								
<Header>								
Y: V notch type product								
W: V notch and post edge horseshoe bend type product		Note*						
Packing								
G: 3,000 pieces embossed tape and plastic reel × 2*								

Note:  
The post edge horseshoe bend indicated by the "W" in the tenth digit of the header part number refers to a construction that makes it difficult for the header post edge to deform when the connector is inserted and removed at an angle.

\* Only a socket of mated height 3.5 mm and 4.0 mm: 2,000 pieces embossed tape and plastic reel × 2.



## PRODUCT TYPES

### 1. Without retention fitting **TOUGH CONTACT**

Mated height	Number of contacts	Part number			Packing	
		Socket	Header		Inner carton	Outer carton
		<b>TOUGH CONTACT</b>	<b>TOUGH CONTACT</b>	<b>TOUGH CONTACT</b> and Post edge horseshoe bend type (Recommendation)		
1.5 mm	14	AXK714147G	AXK814145YG	AXK814145WG	3,000 pieces	6,000 pieces
	16	AXK716147G	AXK816145YG	AXK816145WG		
	20	AXK720147G	AXK820145YG	AXK820145WG		
	22	AXK722147G	AXK822145YG	AXK822145WG		
	24	AXK724147G	AXK824145YG	AXK824145WG		
	26	AXK726147G	AXK826145YG	AXK826145WG		
	28	AXK728147G	AXK828145YG	AXK828145WG		
	30	AXK730147G	AXK830145YG	AXK830145WG		
	34	AXK734147G	AXK834145YG	AXK834145WG		
	36	AXK736147G	AXK836145YG	AXK836145WG		
	40	AXK740147G	AXK840145YG	AXK840145WG		
	44	AXK744147G	AXK844145YG	AXK844145WG		
	50	AXK750147G	AXK850145YG	AXK850145WG		
	54	AXK754147G	AXK854145YG	AXK854145WG		
	60	AXK760147G	AXK860145YG	AXK860145WG		
	64	AXK764147G	AXK864145YG	AXK864145WG		
	70	AXK770147G	AXK870145YG	AXK870145WG		
	80	AXK780147G	AXK880145YG	AXK880145WG		
	90	AXK790147G	AXK890145YG	AXK890145WG		
	100	AXK700147G	AXK800145YG	AXK800145WG		
2.0 mm	14	AXK714247G	AXK814145YG	AXK814145WG	3,000 pieces	6,000 pieces
	20	AXK720247G	AXK820145YG	AXK820145WG		
	24	AXK724247G	AXK824145YG	AXK824145WG		
	26	AXK726247G	AXK826145YG	AXK826145WG		
	30	AXK730247G	AXK830145YG	AXK830145WG		
	34	AXK734247G	AXK834145YG	AXK834145WG		
	40	AXK740247G	AXK840145YG	AXK840145WG		
	50	AXK750247G	AXK850145YG	AXK850145WG		
	70	AXK770247G	AXK870145YG	AXK870145WG		
	80	AXK780247G	AXK880145YG	AXK880145WG		
2.5 mm	14	AXK714347G	AXK814145YG	AXK814145WG	3,000 pieces	6,000 pieces
	20	AXK720347G	AXK820145YG	AXK820145WG		
	24	AXK724347G	AXK824145YG	AXK824145WG		
	30	AXK730347G	AXK830145YG	AXK830145WG		
	40	AXK740347G	AXK840145YG	AXK840145WG		
	44	AXK744347G	AXK844145YG	AXK844145WG		
	50	AXK750347G	AXK850145YG	AXK850145WG		
	60	AXK760347G	AXK860145YG	AXK860145WG		
	70	AXK770347G	AXK870145YG	AXK870145WG		
	90	AXK790347G	AXK890145YG	AXK890145WG		
	100	AXK700347G	AXK800145YG	AXK800145WG		

Notes: 1. Regarding ordering units; During production: Please make orders in 1-reel units.

Samples for mounting confirmation: Available in units of 50 pieces. Please consult us. (See "Regarding sample orders to confirm proper mounting" on page 13.)

Samples: Small lot orders are possible.

2. The standard type comes without positioning bosses. Connectors with positioning bosses are available on-demand production. For this type of connector, 8th digit of the part number changes from 4 to 3. e.g. Mated height 1.5 mm and 20 contacts for socket without retention fitting: AXK720137G

3. The 10th digit "Y" in the header part number indicates the connector has V notch. (For details, please refer to page 36.)

"W" indicates a product with V notch and post edge horseshoe bend. ("Post edge horseshoe bend" refers to a construction that makes it difficult for the header post edge to deform when the connector is inserted and removed at an angle.)

"Products with V notch" and "products with V notch and post edge horseshoe bend" are mating compatible.

4. Connectors of different mated height (3.0 mm, 3.5 mm and 4.0 mm) and different number of contacts are available on-demand production only. Please contact us for more details.

# SPECIFICATIONS

## 1. Characteristics

	Item	Specifications	Conditions
Electrical characteristics	Rated current	0.3A/contact (Max. 5 A at total contacts)	
	Rated voltage	60V AC/DC	
	Breakdown voltage	150V AC for 1 min.	Detection current: 1mA
	Insulation resistance	Min. 1,000MΩ (initial)	Using 250V DC megger (applied for 1 min.)
	Contact resistance	Max. 70mΩ	Measured based on the HP4338B measurement method of JIS C 5402
Mechanical characteristics	Composite insertion force	Max. 0.981N {100gf}/contacts × contacts (initial)	
	Composite removal force	Min. 0.0588N {6gf}/contacts × contacts (Mated height 1.5 mm, without removal and retention fitting) Min. 0.118N {12gf}/contacts × contacts (Mated height 1.5 mm, except without removal and retention fitting)	
	Post holding force	Min. 0.981N {100gf}/contacts	Measures the maximum load in the post axial direction until removal
Environmental characteristics	Ambient temperature	−55°C to +85°C	No freezing at low temperatures
	Soldering heat resistance	Max. peak temperature of 245°C	Infrared reflow soldering
		300°C within 5 sec. 350°C within 3 sec.	Soldering iron
	Thermal shock resistance (header and socket mated)	5 cycles, insulation resistance min. 100MΩ, contact resistance max. 70mΩ	Sequence 1. −55 <sup>+3</sup> °C, 30 minutes 2. ~, Max. 5 minutes 3. 85 <sup>+3</sup> °C, 30 minutes 4. ~, Max. 5 minutes
	Humidity resistance (header and socket mated)	120 hours, insulation resistance min. 100MΩ, contact resistance max. 70mΩ	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. 70mΩ	Bath temperature 35±2°C, saltwater concentration 5±1%
Lifetime characteristics	H <sub>2</sub> S resistance (header and socket mated)	48 hours, contact resistance max. 70mΩ	Bath temperature 40±2°C, gas concentration 3±1 ppm, humidity 75 to 80% R.H.
	Insertion and removal life	50 times	Repeated insertion and removal speed of max. 200 times/hours
Unit weight		Mated height 1.5mm, 20 contacts; Socket: 0.04g Header: 0.02g	

## 2. Material and surface treatment

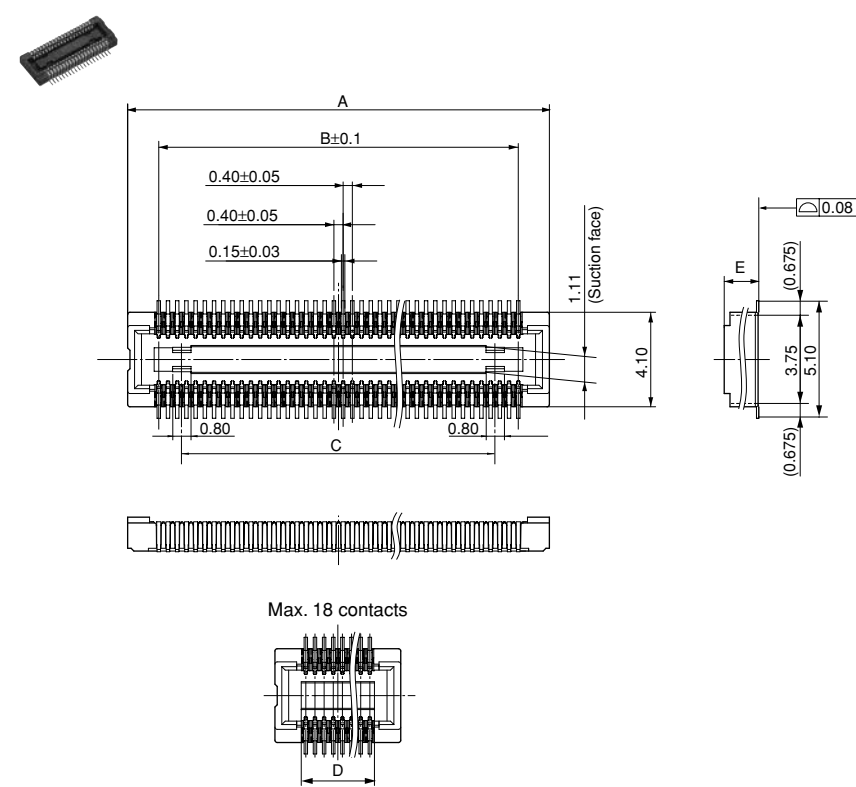
Part name	Material	Surface treatment
Molded portion	Heat-resistant resin (UL94V-0), Black	—
Contact and Post	Copper alloy	Contact portion: Ni plating on base, Au plating on surface Terminal portion: Ni plating on base, Au plating on surface (Except for thick of terminal) However, upper terminal of Ni barrier production: Exposed over Ni The area adjacent to the terminal of the sockets on models with Ni barrier is exposed to Ni on base.
Retention fitting portion	Copper alloy	Ni plating on base, Sn plating on surface (Except for front terminal)

AXK7, 8

DIMENSIONS (mm)

1. Without Retention Fitting

Socket (Mated height: 1.5 mm, 2.0 mm, and 2.5 mm)



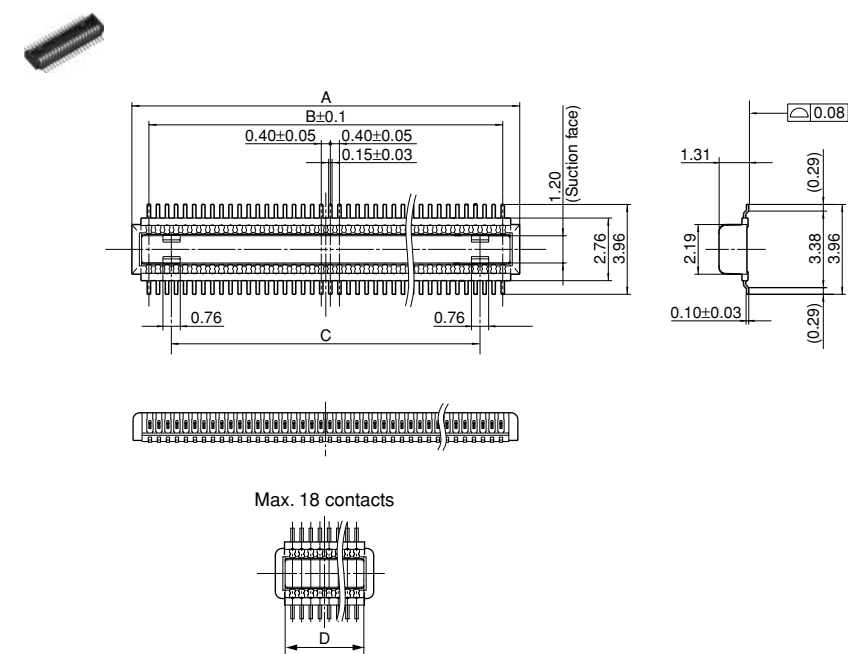
General tolerance: ±0.2

Dimension table (mm)

Number of contacts/ dimension	A	B	C	D
14	5.1	2.4	—	2.8
16	5.5	2.8	—	3.2
20	6.3	3.6	1.6	—
22	6.7	4.0	2.0	—
24	7.1	4.4	2.4	—
26	7.5	4.8	2.8	—
28	7.9	5.2	3.2	—
30	8.3	5.6	3.6	—
34	9.1	6.4	4.4	—
36	9.5	6.8	4.8	—
40	10.3	7.6	5.6	—
44	11.1	8.4	6.4	—
50	12.3	9.6	7.6	—
54	13.1	10.4	8.4	—
60	14.3	11.6	9.6	—
64	15.1	12.4	10.4	—
70	16.3	13.6	11.6	—
80	18.3	15.6	13.6	—
90	20.3	17.6	15.6	—
100	22.3	19.6	17.6	—

Mated height/dimension	E
1.5mm	1.50
2.0mm	1.92
2.5mm	2.42

Header (Mated height: 1.5 mm, 2.0 mm, and 2.5 mm “products with V notch”)



General tolerance: ±0.2

Dimension table (mm)

Number of contacts/ dimension	A	B	C	D
14	3.9	2.4	—	3.04
16	4.3	2.8	—	3.44
20	5.1	3.6	1.6	—
22	5.5	4.0	2.0	—
24	5.9	4.4	2.4	—
26	6.3	4.8	2.8	—
28	6.7	5.2	3.2	—
30	7.1	5.6	3.6	—
34	7.9	6.4	4.4	—
36	8.3	6.8	4.8	—
40	9.1	7.6	5.6	—
44	9.9	8.4	6.4	—
50	11.1	9.6	7.6	—
54	11.9	10.4	8.4	—
60	13.1	11.6	9.6	—
64	13.9	12.4	10.4	—
70	15.1	13.6	11.6	—
80	17.1	15.6	13.6	—
90	19.1	17.6	15.6	—
100	21.1	19.6	17.6	—

Note: “Products with V notch” and “products with V notch and post edge horseshoe bend” are mating compatible.



## 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



## Cameras Applications

*your BEST camera module partner*



### IMAGING DEVICES



## 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
<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



## 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
		Width	The Naked Eye	Follows Approval Data Sheet
		Length	The Naked Eye	Follows Approval Data Sheet
		Overall	The Naked Eye	Follows Approval Data Sheet

## KLT Package Solutions

KLT Camera Module



Complete with Lens Protection Film



Tray with Grid and Space



Place Cameras on the Tray





## Camera Modules Package Solution

Full Tray of Cameras



Cover Tray with Lid



Put Tray into Anti-Static Bag



Vacuum the Anti-Static Bag





## Camera Modules Package Solution

**Sealed Vacuum Bag with Labels**

**1. Model and Description 2. Quantity 3. Shipping Date 4. Caution**



## Large Order Package Solution

Place Foam Sheets Between Trays



Foam Sheets are Slightly Larger than Trays



Place Foam Sheets and Trays into Box



Foam Sheets are Tightly Fitting Box





## Small Order Package Solution

Place Foam Sheets and Trays into Small Box



Foam Sheets are Nicely Fitting the Small Box



Package in Small Box for Shipment



Place Small Boxes into Larger Box





## Carbon Box Package Solution

Seal the Carbon Box

Final Package Labelled Box



### Carbon Box Ready for Shipment

1. Delivery Address and Phone No. 2. Box No. and Ship Date 3. Fragile Caution



## Sample Order Package Solution

Place Sample into Small Anti-Static Bag



Place Connectors into Small Ant-Static Bag



### Sample Labels on the Small Bag

1. Camera Module or Connector Model 2. Shipping Date and Quantity 3. Caution





## Connectors Large Order Package Solution

Connectors in a Wheel



Label Connectors in the Wheel



The Wheel is Perfectly Fitting the Box



Connectors Box Ready for Shipment







# CMOS CAMERA MODULES



*your BEST camera module partner*

## Company Kai Lap Technologies (KLT)

Kai Lap Technologies Group Limited. (KLT) was established in 2009, a next-generation technology driven manufacturer specialized in research, design, and produce of audio and video products. KLT is occupying 20,000 square feet automated plants with 100 employees of annual throughput 30,000,000 units cameras.

KLT provides OEM, ODM design, contract manufacturing, and builds the camera products. You may provide the requirements to us, even with a hand draft, our sales and engineering work together to meet your needs. We consider ourselves your last-term partner in developing practical and innovative solutions.

Our team covers everything from initial concept development to mass produced product. KLT specializes in customized camera design, raw material, electronic engineering, firmware/software development, product testing, and packing design. Our experienced strategic supply systems offer a robust and dependable manufacturing capacity for orders of various sizes.



## Limited Warranty

KLT provides the following limited warranty if you purchased the Product(s) directly from KLT company or from KLT's website, [www.KaiLapTech.com](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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# CMOS CAMERA MODULES



*your BEST camera module partner*

## KLT Strength

### Powerful Factory



### Professional Service



### Promised Delivery



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