

KLT-B9MF-IMX577 V4.0

12.3MP Sony IMX577 MIPI Interface M12 Fixed Focus Camera Module



Front View



Back View

Specifications

Camera Module No.	KLT-B9MF-IMX577 V4.0
Resolution	12.3MP
Image Sensor	IMX577
Sensor Type	1/2.3"
Pixel Size	1.55 um x 1.55 um
EFL	4.55 mm
F.NO	3.20
Pixel	4056 x 3040
View Angle	82.0°(DFOV) 67.5°(HFOV) 53.3°(VFOV)
Lens Dimensions	17.20 x 17.20 x 23.02 mm
Module Size	52.09 x 24.20 mm
Module Type	Fixed Focus
Interface	MIPI
Auto Focus VCM Driver IC	None
Lens Type	650nm IR Cut
Operating Temperature	-10°C to +70°C
Mating Connector	BM20B(0.8)-30DS-0.4V(51)

KLT-B9MF-IMX577 V4.0**12.3MP Sony IMX577 MIPI Interface M12 Fixed Focus Camera Module**

Top View



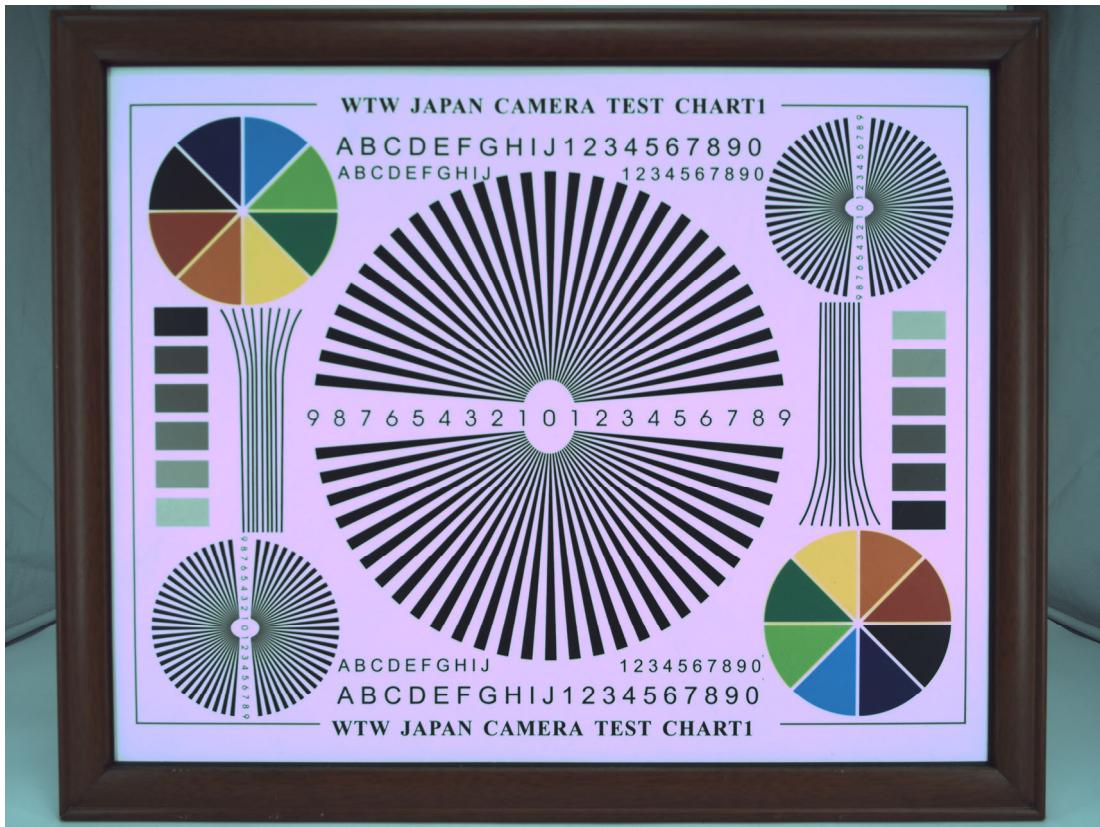
Side View



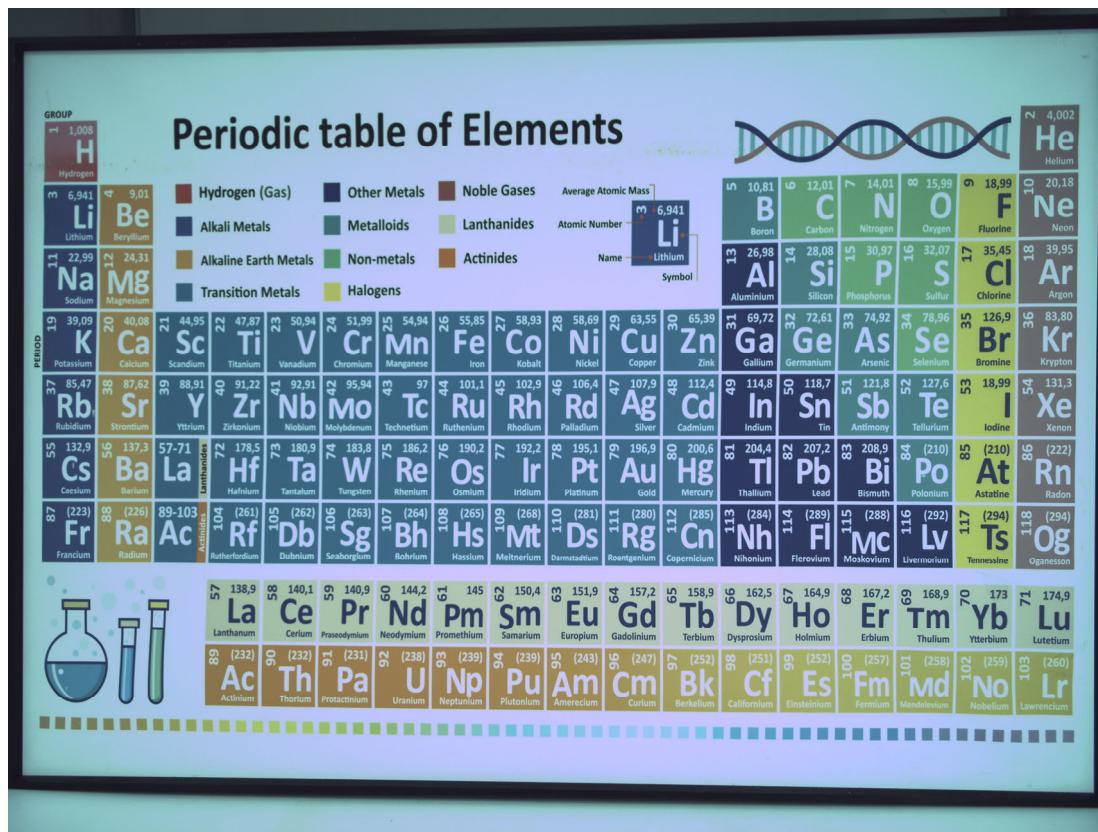
Bottom View



Mating Connector







A	B	C	D	E																																																																								
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<p>NOTE: 1.Sensor I2C slave address:0x34</p> <p>Parameters: 1. Sensor specification: Image Sensor: IMX577-AACK-C Pixel: 1.55um*1.55um Lens Type: 1/2.3 Important Voltage Description: DVDD1.05V (External power supply);</p>	<p>2. Lens specification: FOV: 82° (D) ;67.5° (H) ;53.3° (V) F/NO.: 3.2 TV distortion: <0.5% Focal length: 4.55mm Composition: 3G2P+IR FILTER IR Cut Coating: 650nm±10nm@50%</p>	<p>Kai Lap Technologies Group Ltd</p> <table border="1"> <tr> <td>Designed By</td><td>Kevin</td><td>Model Name:</td><td colspan="2">KLT-B9MF-IMX577 V4.0</td></tr> <tr> <td>Checked By</td><td>Jacky</td><td>Projection Type:</td><td>Unit: mm</td><td>Date: 12/10/2025</td></tr> <tr> <td></td><td></td><td>Third Angle</td><td>Scale: 1:1</td><td>Sheet: 1 of 1</td></tr> <tr> <td></td><td></td><td></td><td></td><td>Version: 1/0</td></tr> </table>	Designed By	Kevin	Model Name:	KLT-B9MF-IMX577 V4.0		Checked By	Jacky	Projection Type:	Unit: mm	Date: 12/10/2025			Third Angle	Scale: 1:1	Sheet: 1 of 1					Version: 1/0																																																						
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[Product Information]

Ver.1.0

IMX577-AACK

Diagonal 7.857 mm (Type 1/2.3) 12.3 Mega-Pixel CMOS Image Sensor with Square Pixel for Color Cameras

Description

The IMX577-AACK is a diagonal 7.857 mm (Type 1/2.3) 12.3 Mega-pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Sony's Stacked CMOS Image Sensor 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. It equips an electronic shutter with variable integration time. It operates with three power supply voltages: analog 2.8 V, digital 1.05 V and 1.8 V for input/output interface and achieves low power consumption.

In addition, this product is designed for use in consumer use camcorder. When using this for another application, Sony Semiconductor Solutions Corporation does not guarantee the quality and reliability of product. Therefore, don't use this for applications other than consumer use camcorder.

In addition, individual specification change cannot be supported because this is a standard product.

Consult your Sony Semiconductor Solutions Corporation sales representative if you have any questions.

Features

- ◆ Back-illuminated and stacked CMOS image sensor
- ◆ Digital Overlap High Dynamic Range (DOL-HDR) mode with raw data output.
- ◆ High signal to noise ratio (SNR).
- ◆ Full resolution @60 frame/s (Normal), 4K2K @60 frame/s (Normal), 1080p @240 frame/s
Full resolution @40 frame/s (12 bit Normal), Full resolution @30 frame/s (DOL-HDR, 2 frame)
- ◆ Output video format of RAW12/10/8, COMP8.
- ◆ Power Save Mode with MIPI ULPS operation
- ◆ Pixel binning readout and V sub-sampling function.
- ◆ Independent flipping and mirroring.
- ◆ Input clock frequency 6 to 27 MHz
- ◆ CSI-2 serial data output (MIPI 2lane/4lane, Max. 2.1 Gbps/lane, D-PHY spec. ver. 1.2 compliant)
- ◆ 2-wire serial communication.
- ◆ Two PLLs for independent clock generation for pixel control and data output interface.
- ◆ Defect Pixel Correction (DPC)
- ◆ Ambient Light Sensor (ALS)
- ◆ Fast mode transition. (on the fly)
- ◆ Dual sensor synchronization operation (Multi camera compatible)
- ◆ 7 k bit of OTP ROM for users.
- ◆ Built-in temperature sensor
- ◆ 10-bit/12-bit A/D conversion on chip
- ◆ Horizontal Low Power Analog Cropping
- ◆ Window Scanning mode
- ◆ 92-pin high-precision ceramic package

Sony reserves the right to change products and specifications without prior notice.

Sony logo is a registered trademark of Sony Corporation.

Device Structure

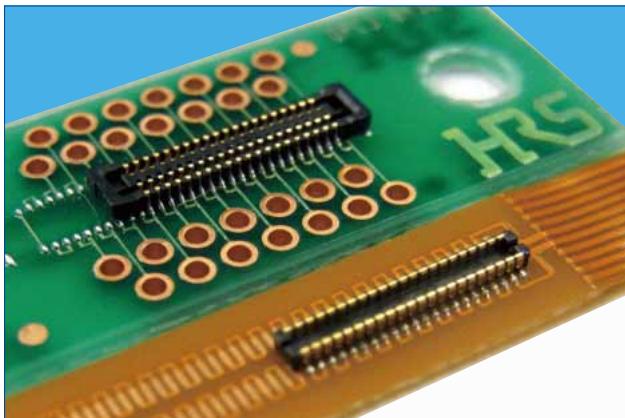
◆ CMOS image sensor	Diagonal 7.857 mm (Type 1/2.3)
◆ Image size	4072 (H) × 3176 (V) approx. 12.93 M pixels
◆ Total number of pixels	4072 (H) × 3064 (V) approx. 12.47 M pixels
◆ Number of effective pixels	4056 (H) × 3040 (V) approx. 12.33 M pixels
◆ Number of active pixels	7.564 mm (H) × 5.476 mm (V)
◆ Chip size	1.55 μ m (H) × 1.55 μ m (V)
◆ Unit cell size	92 pin LGA
◆ Package	

Image Sensor Characteristics(T_j = 60 °C)

Item	Value	Remarks
Sensitivity (F2.8)	250 LSB	1/120 s integration
Saturation signal	1023 LSB	

Basic Drive Mode

Drive mode	Number of active pixels	Maximum frame rate [frame/s]	Output interface	ADC [bit]
Full (4:3) (Normal)	4056 (H) × 3040 (V) approx. 12.33 M pixels	60	CSI-2	10
		43	CSI-2	12
Full (4:3) (DOL-HDR)	4056 (H) × 3040 (V) approx. 12.33 M pixels	DOL 2 frame : 30 DOL 3 frame : 15	CSI-2	10
Full (16:9) 4K2K (Normal)	4056 (H) × 2288 (V) approx. 9.28 M pixels	79	CSI-2	10
Full (16:9) 4K2K (DOL-HDR)	4056 (H) × 2288 (V) approx. 9.28 M pixels	DOL 2 frame : 39 DOL 3 frame : 19	CSI-2	10
Full (4:3) Binning (Normal)	2028 (H) × 1520 (V) approx. 3.08 M pixels	178	CSI-2	10
Full (16:9) Binning 1080P (Normal)	2028 (H) × 1112 (V) approx. 2.26 M pixels	241	CSI-2	10
Full (16:9) Binning 720P (Normal)	1352 (H) × 740 (V) approx. 1.00 M pixels	241	CSI-2	10
Full (16:9) Scaling 1080P (Normal)	2028 (H) × 1144 (V) approx. 2.32 M pixels	79	CSI-2	10
Full (16:9) Scaling 720P (Normal)	1352 (H) × 762 (V) approx. 1.03 M pixels	79	CSI-2	10



■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.

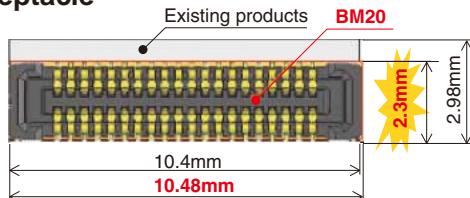
5. Drop and shock resistant structure

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

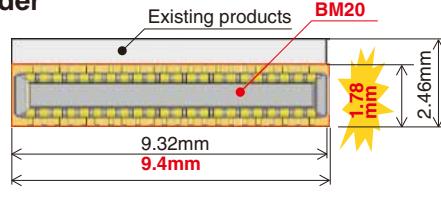
When mated, the connector's design covers the contacts which help to keep dust and other debris away from the contacts. The SMT leads are kept very close to the connector housing which also helps to prevent shorts caused by debris on the exposed contacts

■Receptacle



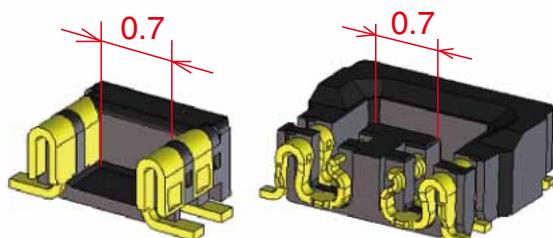
Existing products	BM20
2.98 × 10.4 =About 31.0mm ²	2.3 × 10.48 = About 24.1mm ²

■Header



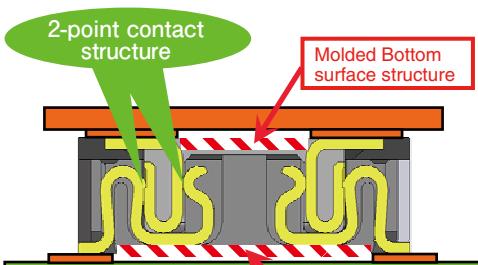
Existing products	BM20
2.46 × 9.32 = About 22.9mm ²	1.78 × 9.4 = About 16.7mm ²

Vaccum pick-up

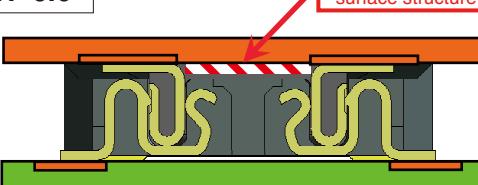


Mating diagram (cross section)

H=0.8



H=0.6



■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 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 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 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

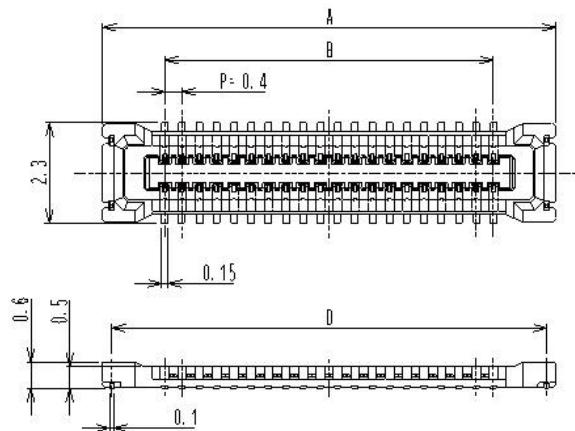
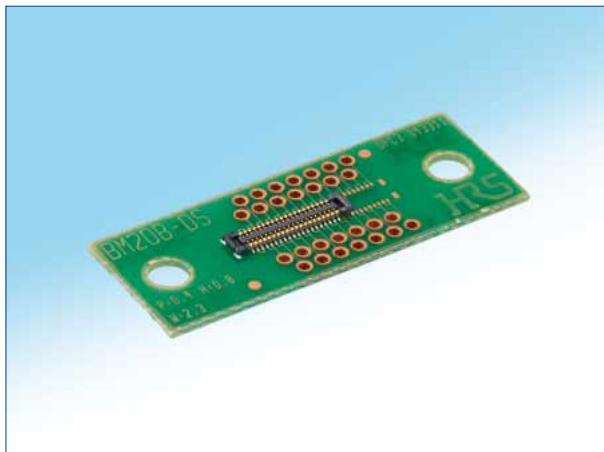
Refer to this page when determining product specifications by model types. Please place orders with part numbers listed in this catalog. The characteristics and specifications of the product described in this catalog are reference values. Please make sure to check the latest delivery specifications at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

●Receptacle/Header

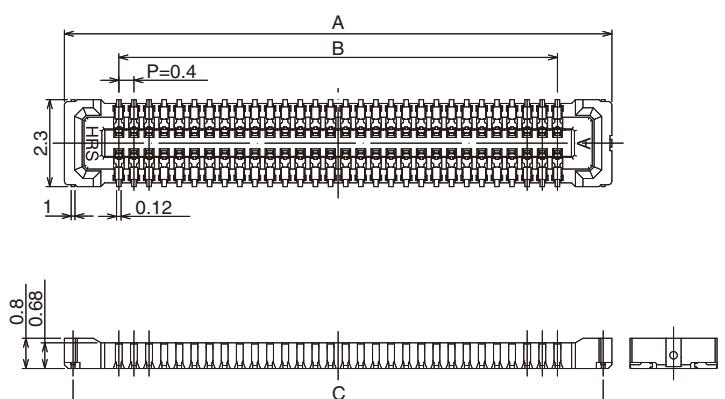
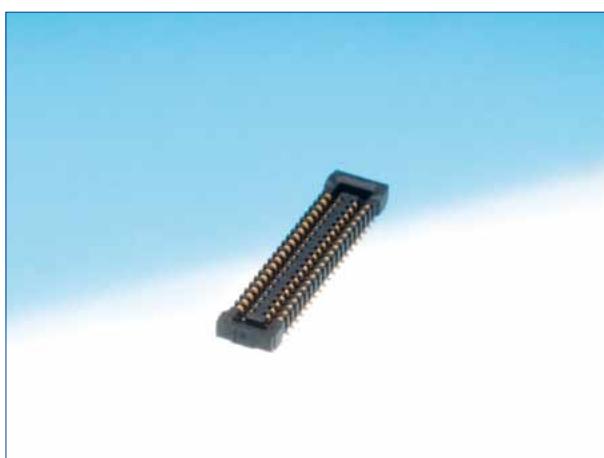
BM 20 # (*) - * DS - 0.4 V (51)**

① Series Name : BM	⑥ Connector Type DS : Double row receptacle DP : Double row header
② Series No. : 20	
③ Shape Symbols B : With reinforcing metal fitting	⑦ Contact Pitch : 0.4mm
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 (51) : Embossed tape package (8,000 pieces per reel)

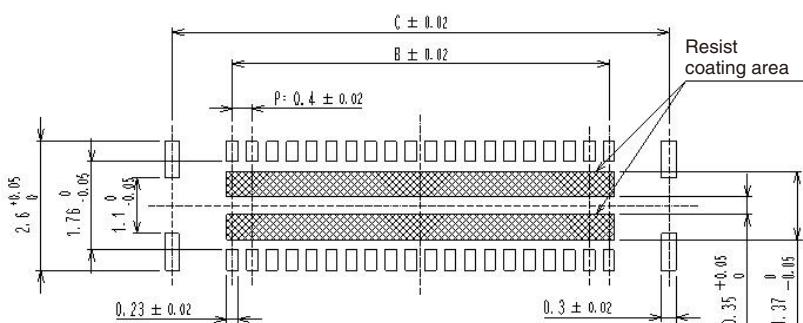
■ H=0.6mm receptacle



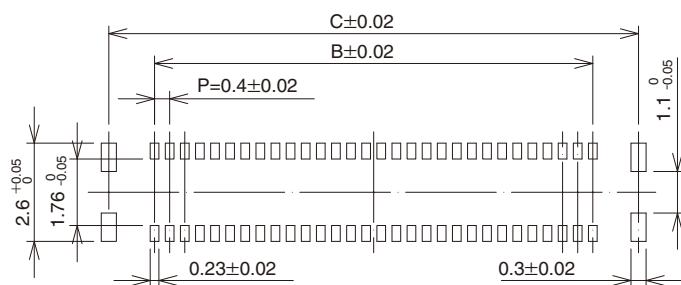
■ H=0.8mm receptacle

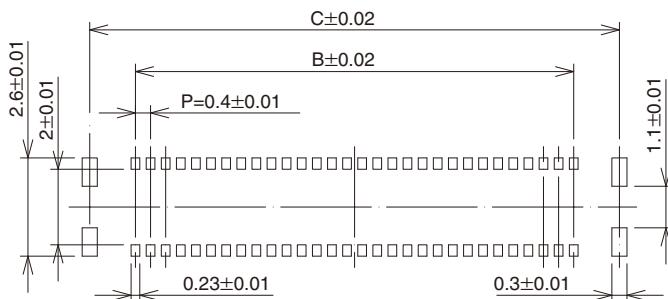


◆ Recommended PCB layout [H= 0.6mm]



◆ Recommended PCB layout [H= 0.8mm]



◆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.

Cameras Applications



Automotive Driver Pilot



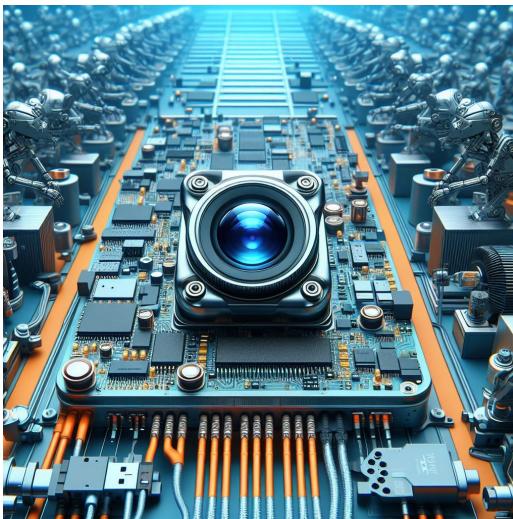
Live Streaming



Video Conference



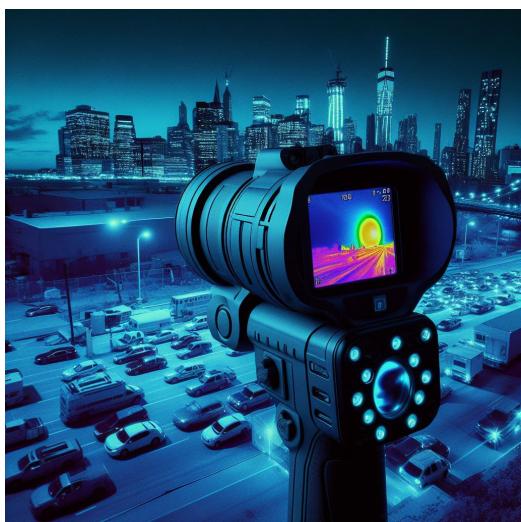
Eye Tracker Biometric Detection



Machine Vision



Agricultural Monitor



Night Vision Security



Drone and Sports Eagle Eyes



Interactive Pet Camera

Cameras Applications



Camera Module Pinout Definition Reference Chart

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



Inspection Item		Inspection Method	Standard of Inspection
Category	Item		
Appearance	FPC/ PCB	Color	The Naked Eye
		Be Torn/Chopped	The Naked Eye
		Marking	The Naked Eye
	Holder	Scratches	The Naked Eye
		Gap	The Naked Eye
		Screw	The Naked Eye
		Damage	The Naked Eye
	Lens	Scratch	The Naked Eye
		Contamination	The Naked Eye
		Oil Film	The Naked Eye
		Cover Tape	The Naked Eye
Function	Image	No Communication	Test Board
		Bright Pixel	Black Board
		Dark Pixel	White board
		Blurry	The Naked Eye
		No Image	The Naked Eye
		Vertical Line	The Naked Eye
		Horizontal Line	The Naked Eye
		Light Leakage	The Naked Eye
		Blinking Image	The Naked Eye
		Bruise	Inspection Jig
		Resolution	Chart
		Color	The Naked Eye
		Noise	The Naked Eye
		Corner Dark	Less Than 100px By 100px
Dimension	Dimension	Color Resolution	The Naked Eye
		Height	The Naked Eye
		Width	The Naked Eye
		Length	The Naked Eye
		Overall	The Naked Eye

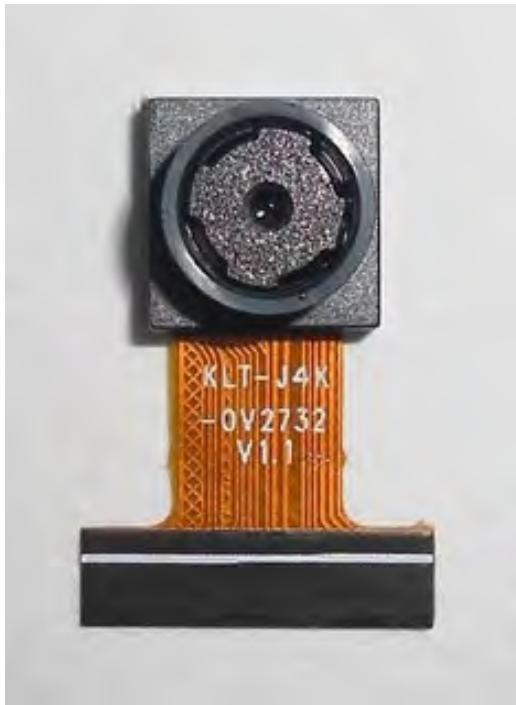


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KLT Package Solutions

KLT Camera Module



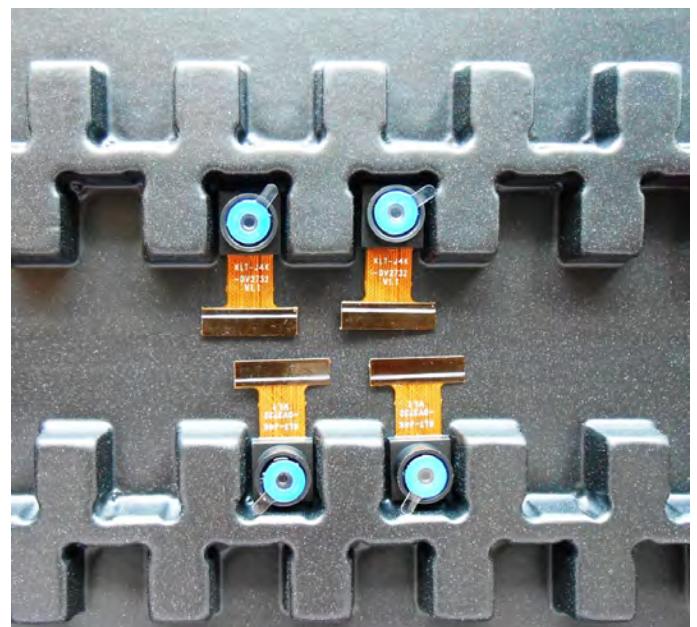
Complete with Lens Protection Film



Tray with Grid and Space



Place Cameras on the Tray



Camera Modules Package Solution

Full Tray of Cameras



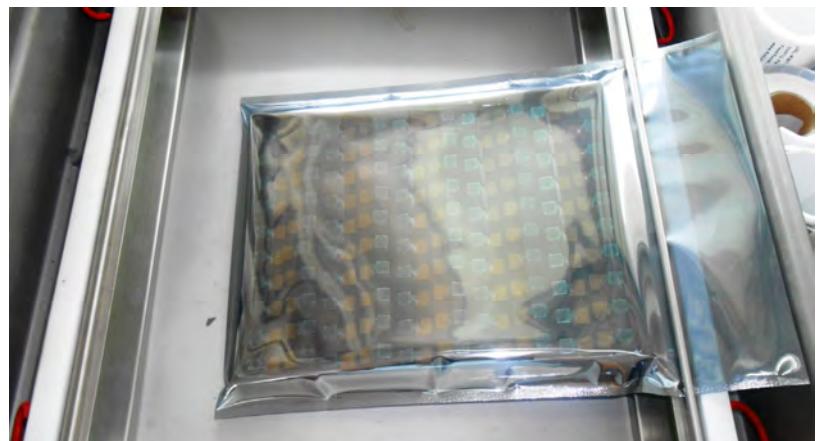
Cover Tray with Lid



Put Tray into Anti-Static Bag



Vacuum the Anti-Static Bag





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Camera Modules Package Solution

Sealed Vacuum Bag with Labels

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



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

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Large Order Package Solution

Place Foam Sheets Between Trays



Foam Sheets are Slightly Larger than Trays



Place Foam Sheets and Trays into Box



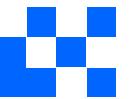
Foam Sheets are Tightly Fitting Box





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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



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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



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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

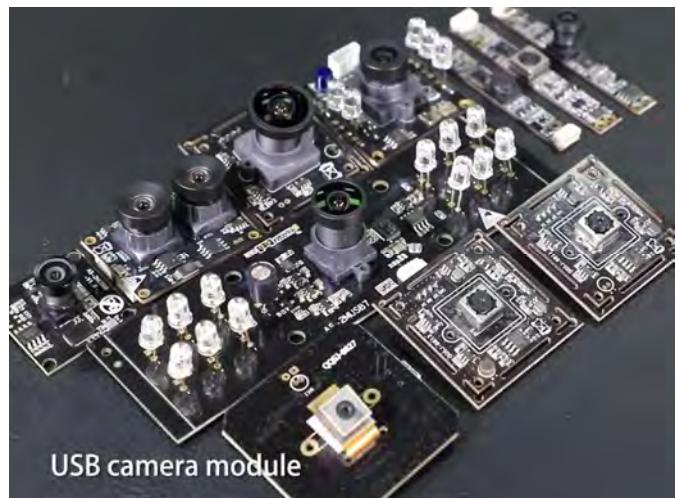


Company Kai Lap Technologies (KLT)

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.

**Limited Warranty**

KLT provides the following limited warranty if you purchased the Product(s) directly from KLT company or from KLT's website, www.KaiLapTech.com. Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. KLT guarantees that the Product(s) will be free from defects in materials and workmanship under normal use for a period of one (1) year from the date you receive the product ("Warranty Period").

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

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



KLT Strength

Powerful Factory



Professional Service



Promised Delivery

