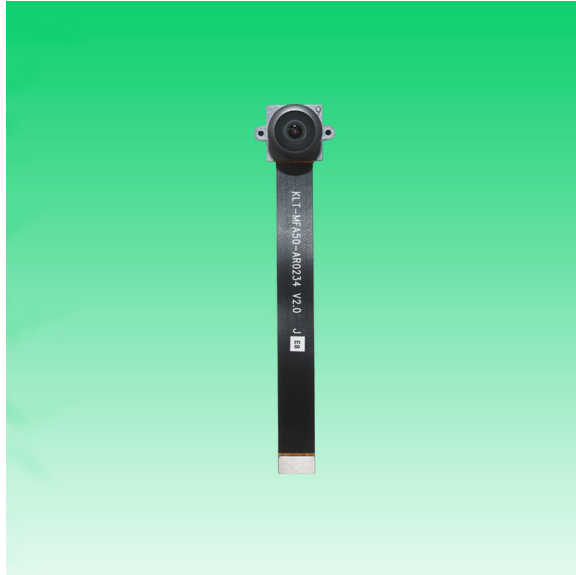# KLT-MFA50-AR0234 V2.0
2.3MP OnSemi AR0234 Global Shutter MIPI Interface
Fixed Focus Camera Module

Front View

Back View

Specifications
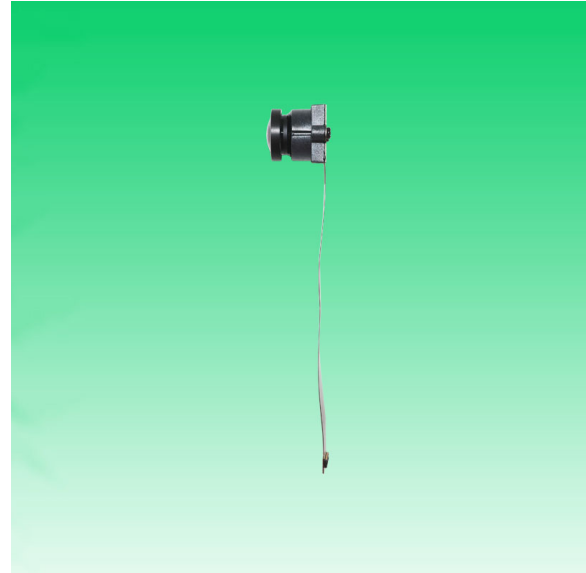
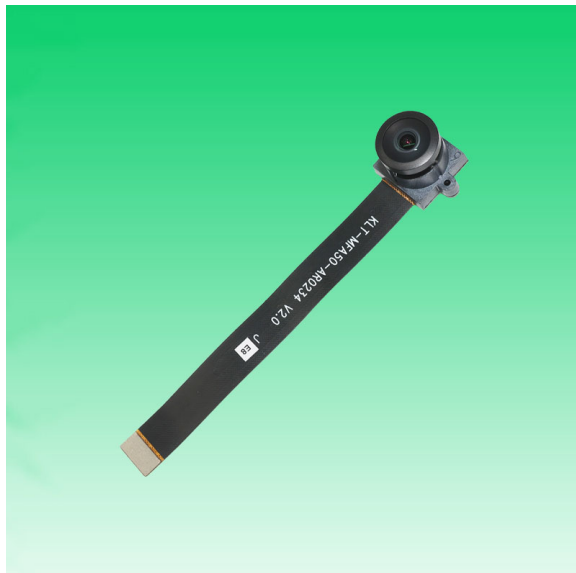| Camera Module No.	KLT-MFA50-AR0234 V2.0
Resolution	2.3MP
Image Sensor	AR0234 Global Shutter
Sensor Type	1/2.6"
Pixel Size	3.0 um x 3.0 um
EFL	2.40 mm
F.NO	2.20
Pixel	1920 x 1200
View Angle	175.6°(DFOV) 144.0°(HFOV) 87.4°(VFOV)
Lens Dimensions	15.30 x 15.30 x 16.10 mm
Module Size	100.35 x 22.00 mm
Module Type	Fixed Focus
Interface	MIPI
Auto Focus VCM Driver IC	None
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +70°C
Mating Connector	DF30FC-30DS-0.4V

KLT-MFA50-AR0234 V2.0
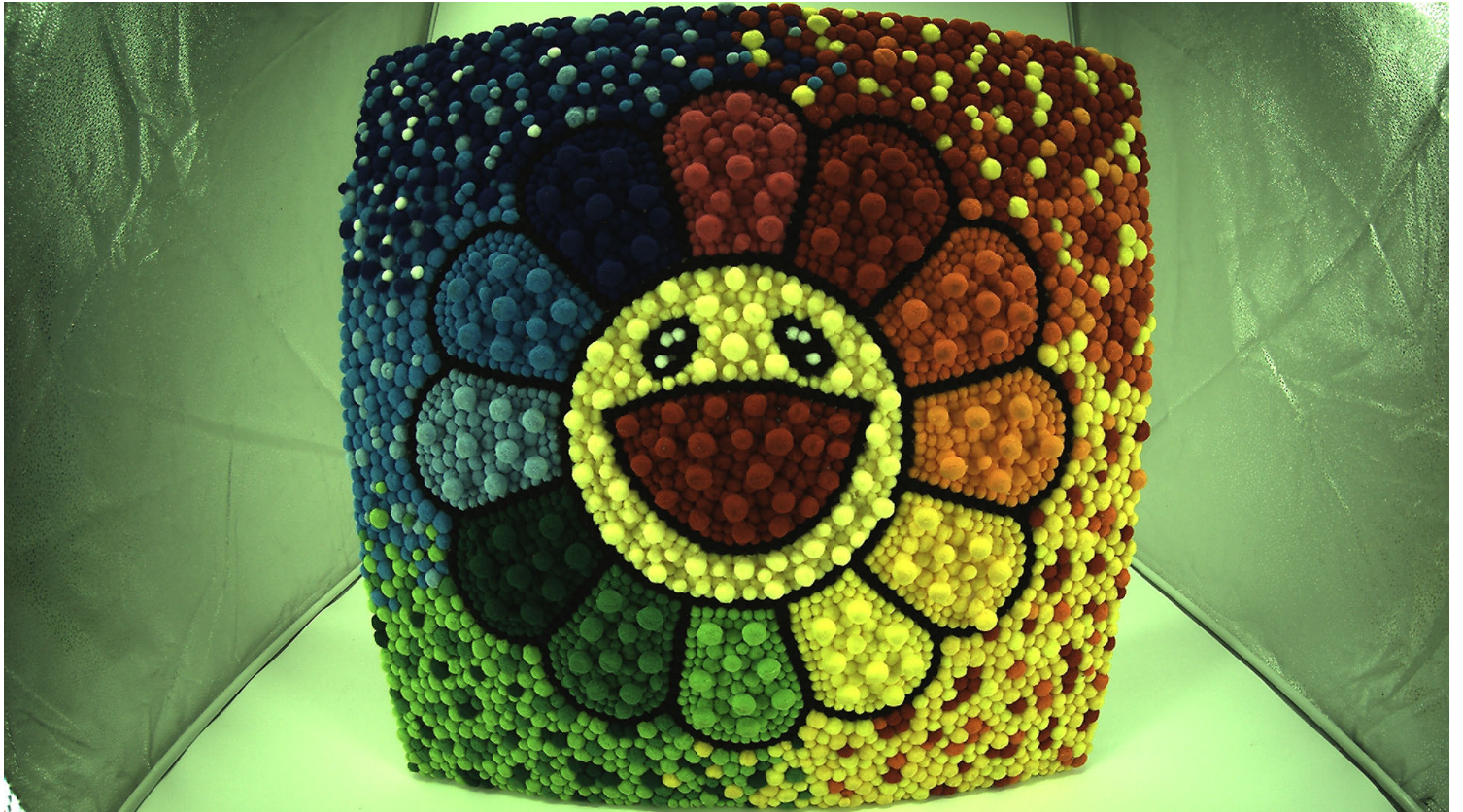### 2.3MP OnSemi AR0234 Global Shutter MIPI Interface Fixed Focus Camera Module
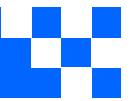

Top View

Side View

Bottom View

Mating Connector

RoHS

PIN	SIGNAL
1	XSHUTDOWN
2	EXTCLK
3	RESET_BAR
4	SDATA
5	SCLK
6	NC
7	DOVDD 1.8V
8	DVDD 1.2V
9	AVDD 2.8V
10	AGND
11	CLK_P
12	CLK_N
13	DGND
14	DATA0_P
15	DATA0_N
16	DGND
17	DATA1_P
18	DATA1_N
19	DGND
20	DATA2_P
21	DATA2_N
22	DGND
23	DATA3_P
24	DATA3_N
25	DGND
26	TRIGGER
27	FLASH
28	NC
29	NC
30	NC

Version	Information
V1.0	First Version
V2.0	Change lens and holder

TOP VIEW

1920
1200
Capture Direction

Ø14.00
15.30±0.15
15.30±0.15
100.35±0.20
Double EMI
5.00±0.10
10.00±0.10

SIDE VIEW

16.10±0.30
9.22±0.20
3.92±0.20
0.30±0.05
Steel Grounding
0.12±0.03
FPC Adhesiveless FCCL，ED
DF30FC-30DP-0.4V
0.20±0.05
Steel Grounding

BOTTOM VIEW

18.00
2XØ1.70
2xR1.00
Double EMI
2.50
5.00
30 16
1 15

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

Parameter：

1、Sensor specification：
Image Sensor：
AR0234CSSC00SUKA0-CP
Pixel：3.0um*3.0um
Lens Type：1/2.6
Important Voltage Description:
DVDD1.2V (external power supply);

2、Lens specification：
FOV：175.6°(D);144°(H);87.4°(V)
F/NO.：2.2
Optical distortion：<-94%
Focal length：2.4mm
Composition：6G+IR FILTER
IR Cut Coating：650nm±10nm@50%

Kai Lap Technologies Group Ltd

Designed By	Kevin	Model Name:	KLT-MFA50-AR0234 V2.0

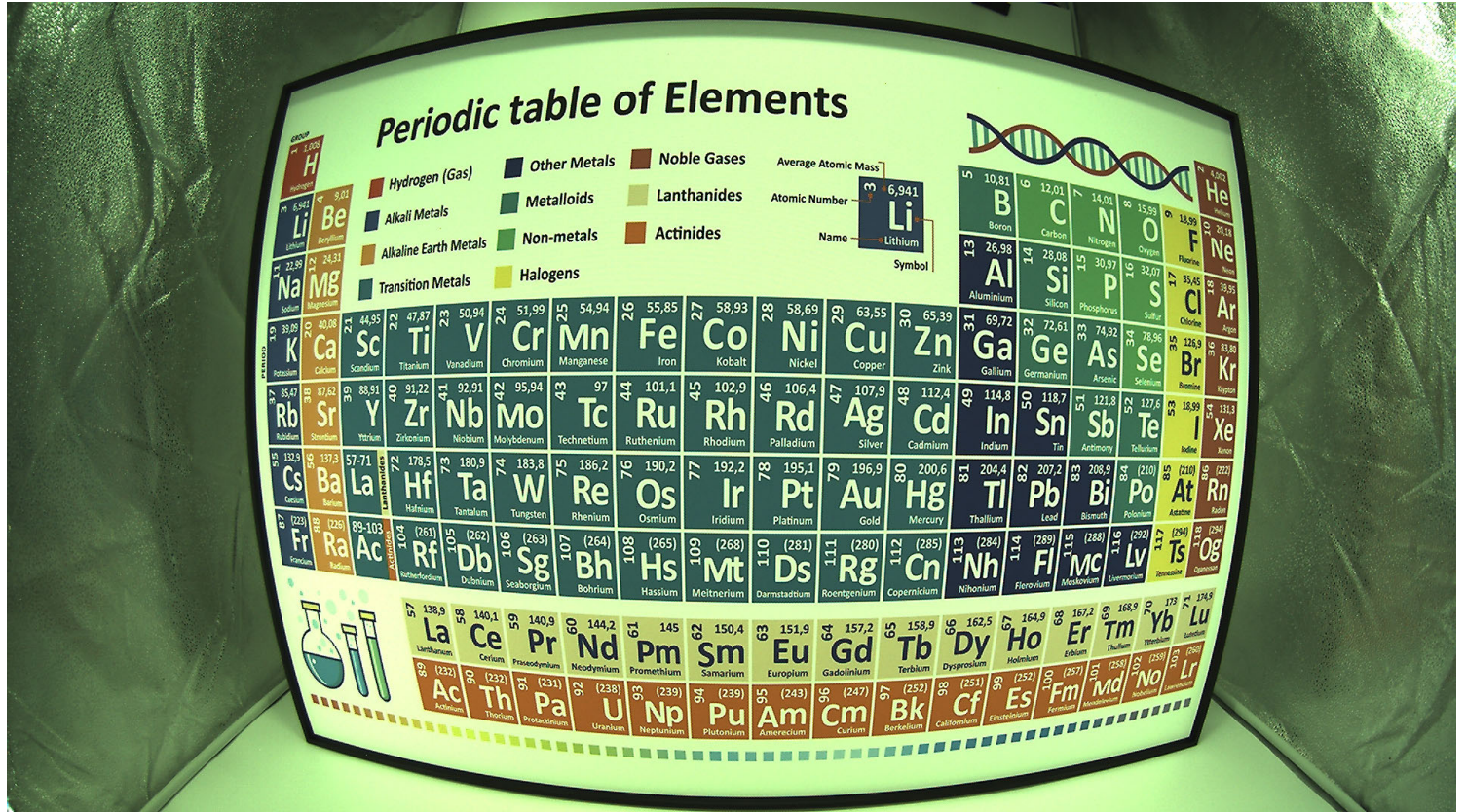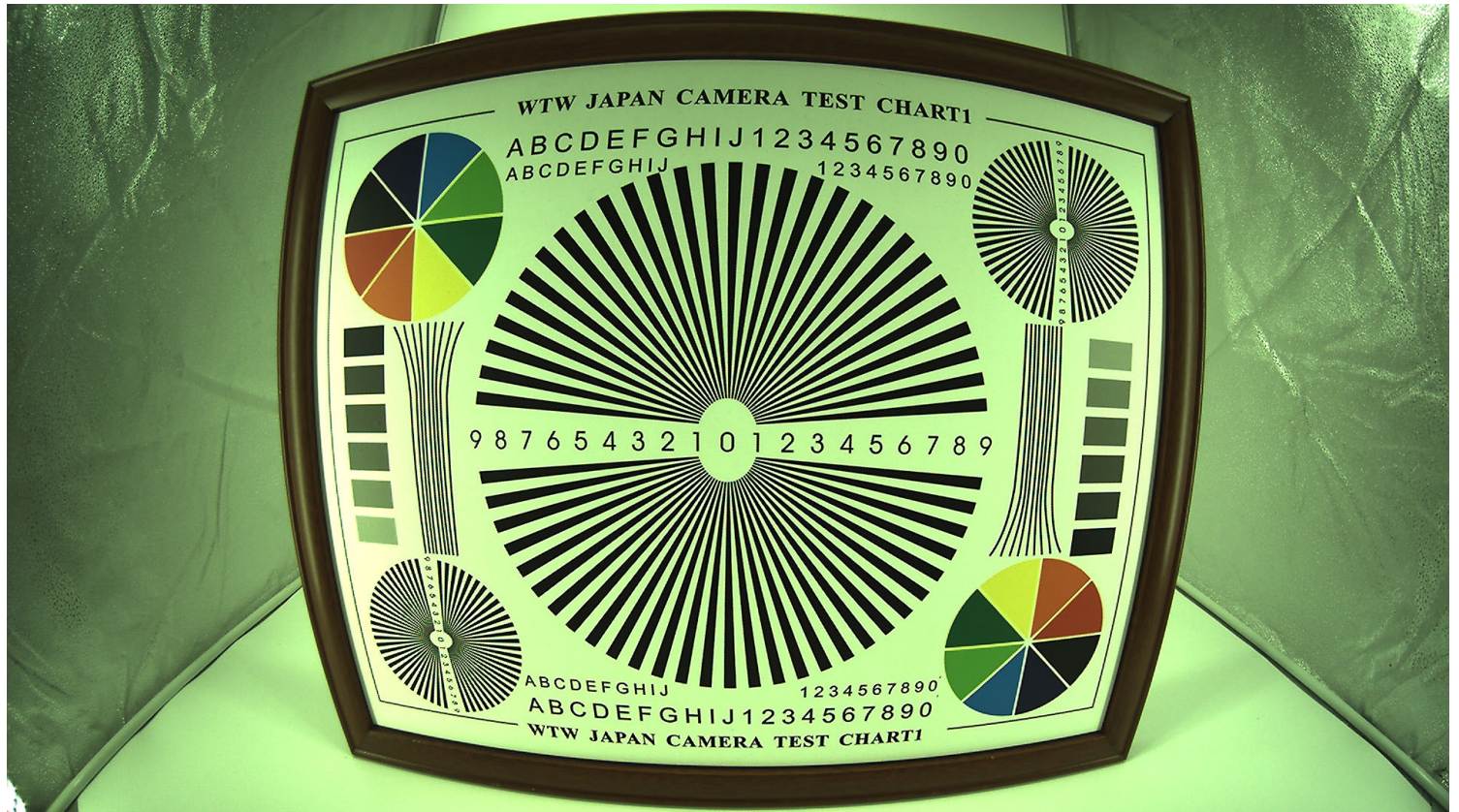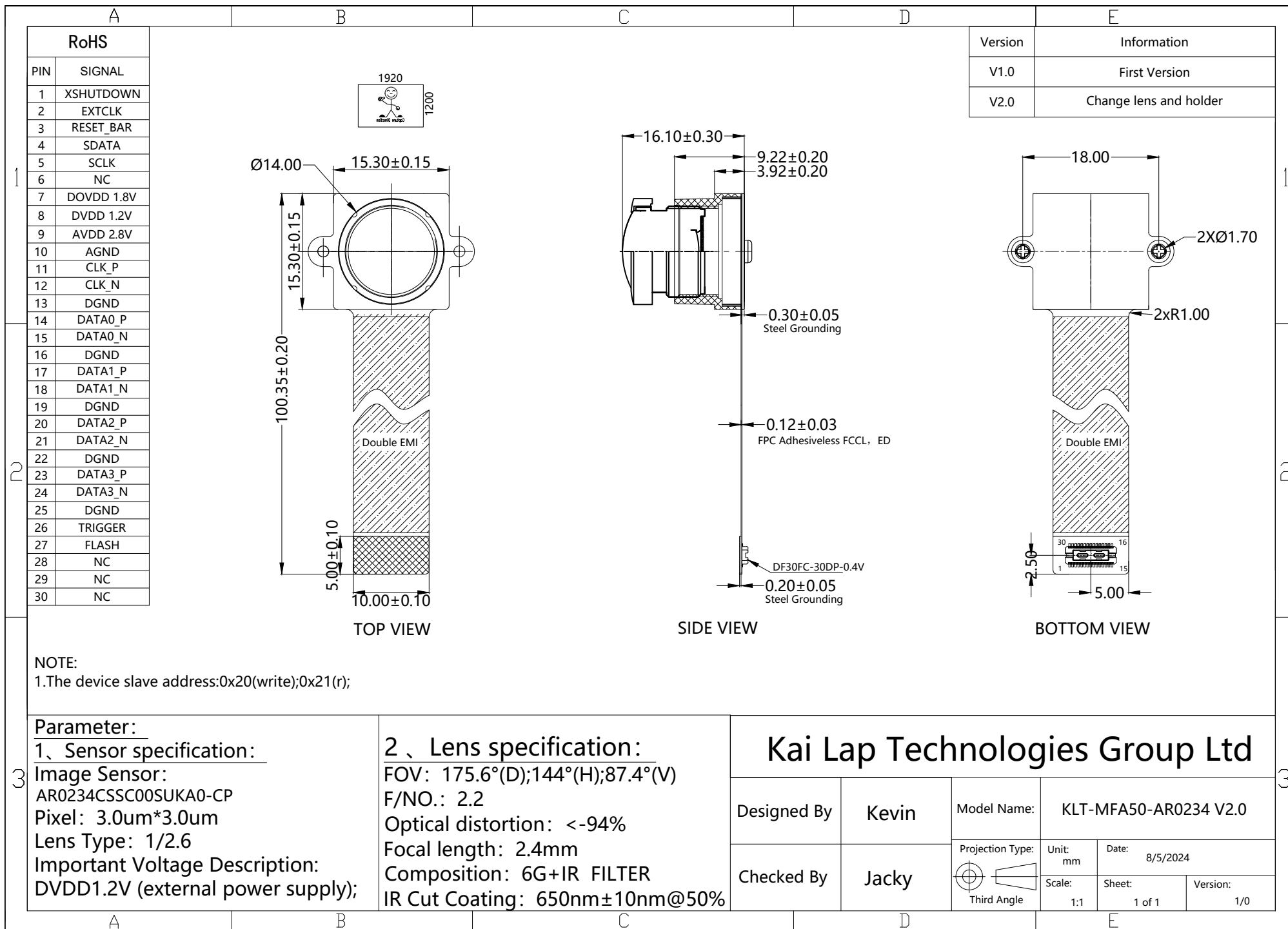| Checked By	Jacky	Projection Type: Third Angle	Unit: mm	Date: 8/5/2024	
			Scale: 1:1	Sheet: 1 of 1	Version: 1/0

AR0234CS

1/2.6-inch 2.3 Mp CMOS Digital Image Sensor with Global Shutter

Product Overview

For complete documentation, see the data sheet.

The AR0234CS is a 1/2.6-inch 2Mp CMOS digital image sensor with an active-pixel array of 1920 (H) x 1200 (V). It incorporates a new innovative global shutter pixel design optimized for accurate and fast capture of moving scenes at 120 frame per second, full resolution. The sensor produces clear, low noise images in both low-light and bright scenes. It includes sophisticated camera functions such as auto exposure control, windowing, row skip mode, column-skip mode, pixel-binning, and both video and single frame modes. It is programmable through a simple two-wire serial interface. The AR0234CS produces extraordinarily clear, sharp digital pictures with an industry leading Global Shutter Efficiency, and its ability to capture both continuous video and single frames makes it the perfect choice for a wide range of applications, including scanning, autonomous mobility, surveillance and industrial quality control.

Features

- Best in Class Global Shutter Efficiency
- Low Dark Current/Hot Pixels

- High Linear Full Well
- Low Operational Power
- Small Form Factor
- Built-In Statistics Engine

- Multiple Functional Modes - Row & Col Skip Modes, Pixel Binning

Benefits

- Superior Image Quality for fast-moving objects
- Reduced Total Noise Floor, Higher SNR delivering High Image Fidelity
- High Dynamic Range, delivers higher image clarity
- Suitable of Battery Powered Applications
- Ideal for Space Constrained Applications
- Offloads Image Processor Loads, provides scene details with Prog. ROI
- Application-specific Image Quality Selections with Performance/Power Trade-offs

Applications

- Gesture recognition
- 3D scanning
- Position tracking
- Machine vision
- AR/VR/MR/XR

End Products

- Autonomous Mobile Robots
- Autonomous Guide Vehicles (Drones)
- Video Doorbells
- AR/VR/MR Headsets
- Barcode Readers

Part Electrical Specifications

Product	Pricing ($/Unit)	Compliance	Status	Type	Megapixels	Frame Rate (fps)	Optical Format	Shutter Type	Pixel Size (µm)	Output Interface	Color	Package Type
AR0234CSSC00SUD20		Pb H	NEW	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	
AR0234CSSC00SUKA0-CP		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	ODCSP-83
AR0234CSSC00SUKA0-CP1		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	ODCSP-83
AR0234CSSC00SUKA0-CR		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	ODCSP-83
AR0234CSSC28SUD20		Pb H	NEW	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	
AR0234CSSC28SUKA0-CP		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	ODCSP-83
AR0234CSSC28SUKA0-CP1		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	ODCSP-83
AR0234CSSC28SUKA0-CR		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Color	ODCSP-83
AR0234CSSM00SUD20		Pb H	NEW	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	
AR0234CSSM00SUKA0-CP		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	ODCSP-83
AR0234CSSM00SUKA0-CP1		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	ODCSP-83
AR0234CSSM00SUKA0-CR		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	ODCSP-83
AR0234CSSM28SUD20		Pb H	NEW	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	
AR0234CSSM28SUKA0-CP		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	ODCSP-83
AR0234CSSM28SUKA0-CP1		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	ODCSP-83
AR0234CSSM28SUKA0-CR		Pb H	Active	CMOS	2.3	120	1/2.6 inch	Global Shutter	3.0 x 3.0		Mono	ODCSP-83

0.4 mm Pitch, 0.9 mm Height, Board-to-Board / Board-to-FPC Connectors

DF30 Series

Extremely small size

Header

(0.40)

(0.90)

(4.56)   (3.76)   (10.22)

Receptacle
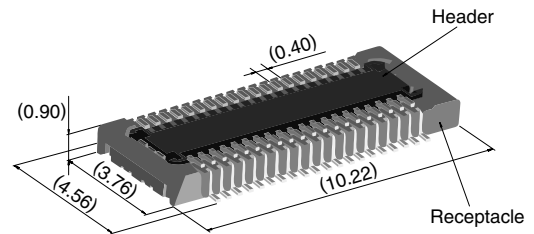
40 positions shown

■Overview

Continuous miniaturization and increased component density on PCB created demand for extremely low profile connectors. This series is addition of a new extremely low profile connectors to Hirose's wide range of high reliability board-to-board/board-to-FPC connection solutions.

■Features

1. Contact reliability

Concentration of the contact's normal forces at the single point assures good contact wipe and electrical reliability, while confirming the fully mated condition with a definite tactile click.

2. Self alignment

Recognizing the difficulties of mating extremely small connectors in limited spaces the connectors will self align in horizontal axis within 0.3 mm.

3. Automatic board placement

Packaged on tape-and-reel the plug and headers have sufficiently large flat areas to allow pick-up with vacuum nozzles of automatic placement equipment.

4. Variety of contact positions and styles

Available in standard contact positions of: 20, 22, 24, 30, 34, 40, 50, 60, 70 and 80 with and without metal fittings. Addition of metal fittings does not affect external dimensionsof the connectors.
Smaller contact positions are also available.

5. Support for continuity test connector

Connectors which have increased insertion and removal durability are available for continuity tests. Contact your Hirose sales representative for details.

■Applications

Cellular phones, PDA's, mobile computers, digital cameras, digital video cameras, and other devices demanding high reliability connections in extremely limited spaces.

■Low profile
■Increased mated retention
■High contact reliability

Header
DF30✳-✳DP-0.4V

0.9mm

Receptacle
DF30✳-✳DS-0.4V

Protrusion improves mated retention

Self alignment

0.3mm

■Product Specifications

Rating	Rated current 0.3A Rated voltage 30V AC	Operating temperature range : -35℃ to 85℃ (Note 1) Operating humidity range : Relative humidity 20% to 80%	Storage temperature range -10℃ to 60℃ (Note 2) Storage humidity range Relative humidity 40% to 70% (Note 2)

Item	Specification	Conditions
1. Insulation resistance	50 MΩ min.	100V DC
2. Withstanding voltage	No flashover or insulation breakdown.	100V AC / one minute
3. Contact resistance	100 mΩ max.	100 mA
4. Vibration	No electrical discontinuity of 1 μs or more	Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis
5. Humidity	Contact resistance: 100 mΩ max. Insulation resistance: 25 MΩ min.	96 hours at temperature of 40℃±2℃ and RH of 90% to 95%
6. Temperature cycle	Contact resistance: 100 mΩ max. Insulation resistance: 50 MΩ min.	Temperature: -55℃→+5℃ to +35℃→+85℃→+5℃ to +35℃ Duration: 30→10→30→10(Minutes) 5 cycles
7. Durability (insertions/withdrawals)	Contact resistance: 100 mΩ max.	50 cycles(Connector for conductivity tests: 500 cycles)
8. Resistance to soldering heat	No deformation of components affecting performance.	Reflow: At the recommended temperature profile Manual soldering: 300℃ for 3 seconds

Note 1: Includes temperature rise caused by current flow.
Note 2: The term "storage" refers to products stored for long period of time prior to mounting and use. Operating temperature range and humidity range covers non-conducting condition of installed connectors in storage, shipment or during transportation.

■Materials and Finishes

Connectors	Component	Material	Finish	Remarks
Receptacles and Headers	Insulator	LCP	Color : Black	UL94V-0
	Contacts	Phosphor bronze	Gold plated	────
	Metal fittings	Phosphor bronze	Tin-cupper plated	────

■Ordering information

●Receptacles and Headers

DF30 FC - ✱DS - 0.4 V (✱✱)
❶   ❷   ❸❹   ❺   ❻   ❼

❶ Series name: DF30	❺ Contact pitch: 0.4 mm

❷ Configuration
  FB: With metal fittings, without bosses
  FC: Without metal fittings, without bosses
  CJ: Connector for conductivity tests
	❻ Termination section
	  V: Straight SMT

	❼ Packaging (81): Embossed tape packaging (5,000 pieces per reel)
❸ Number of positions: 20, 22, 24, 30, 34, 40, 50, 60, 70, 80	(82): Embossed tape packaging (1,000 pieces per reel)

❹ Connector type
  DS: Double row receptacle
  DP: Double row header	

■Receptacles (without metal fittings)
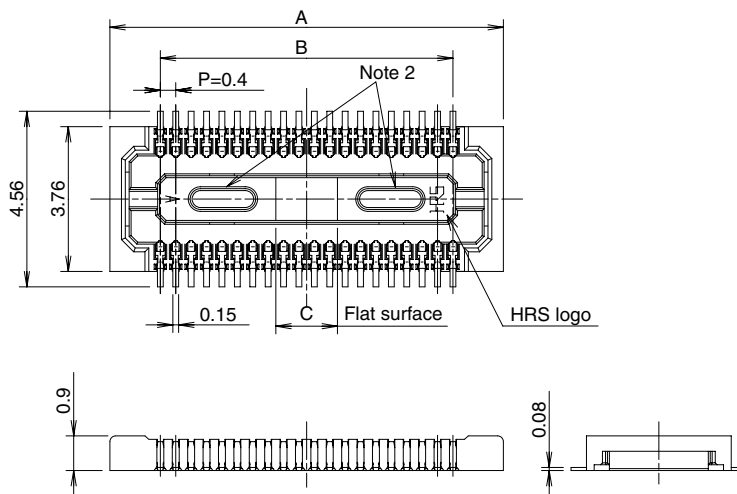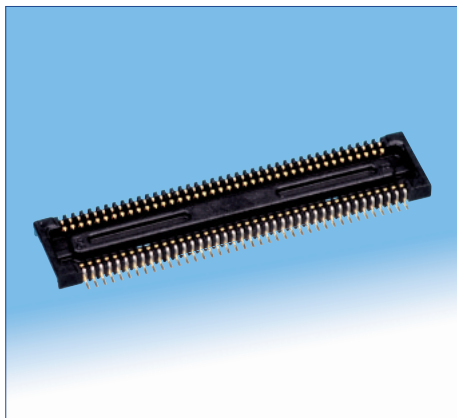
◆Recommended PCB mounting pattern
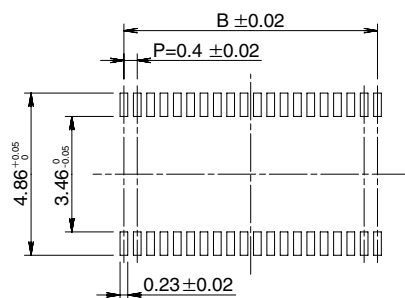
Recommended solder paste thickness: 120 μm

[Specification number] -✳✳, (✳✳)
(81): Embossed tape packaging (5,000 pieces per reel)

* Tolerances non- accumulative.   Unit: mm

Part Number	CL No.	Number of contacts	A	B	C
DF30FC-20DS-0.4V(✳✳)	CL684-1109-8-✳✳	20	6.22	3.6	1.2
DF30FC-22DS-0.4V(✳✳)	CL684-1110-7-✳✳	22	6.62	4.0	1.2
DF30FC-24DS-0.4V(✳✳)	CL684-1111-0-✳✳	24	7.02	4.4	1.2
DF30FC-30DS-0.4V(✳✳)	CL684-1112-2-✳✳	30	8.22	5.6	1.2
DF30FC-34DS-0.4V(✳✳)	CL684-1113-5-✳✳	34	9.02	6.4	1.36
DF30FC-40DS-0.4V(✳✳)	CL684-1078-6-✳✳	40	10.22	7.6	1.6
DF30FC-50DS-0.4V(✳✳)	CL684-1114-8-✳✳	50	12.22	9.6	2.0
DF30FC-60DS-0.4V(✳✳)	CL684-1082-3-✳✳	60	14.22	11.6	2.4
DF30FC-70DS-0.4V(✳✳)	CL684-1115-0-✳✳	70	16.22	13.6	2.8
DF30FC-80DS-0.4V(✳✳)	CL684-1116-3-✳✳	80	18.22	15.6	3.2

Note 1: Order by number of reels.

Note 2: Receptacles with 24 or fewer contacts positions will not have recessed areas.

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

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Cameras Applications

your BEST camera module partner
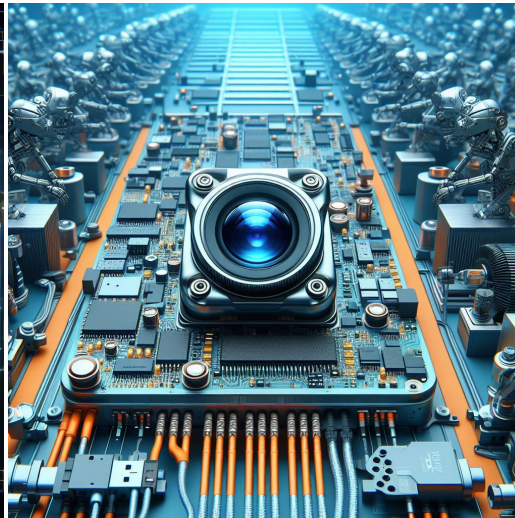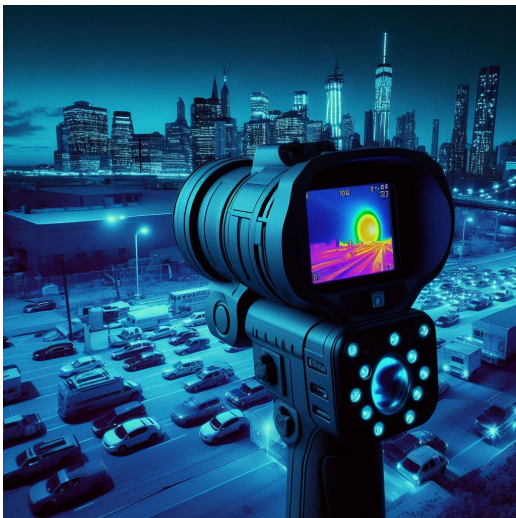
Camera Module Pinout Definition Reference Chart

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
	Storage Temperature — Low -20°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Operation Temperature — High 60°C 24 Hours	Temperature Chamber	No Abnormal Situation
	Operation Temperature — 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
	Drop Test (Free Falling) — With Package 60cm	10 Times on Wood Floor	Electrically Functional
	Vibration Test — 50Hz X-Axis 2mm 30min	Vibration Table	Electrically Functional
	Vibration Test — 50Hz Y-Axis 2mm 30min	Vibration Table	Electrically Functional
	Vibration Test — 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
	ESD Test — 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	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

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

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
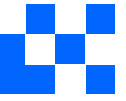

Package in Small Box for Shipment

Place Small Boxes into Larger Box

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

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

Please deliver to:
Kai Lap Technologies Group Ltd.
Kai Lap Technologies Group Ltd.
64-66A Sha Tsui Road, Tsuen Wan
HONG KONG
Attn: Sharon Chan
Phone: + 852 6908 1256

KLT KLT Camera Modules
www.KaiLapTech.com

PKG:
1 of 1
10 August 2017
MADE IN CHINA

KLT KLT Camera Modules
www.KaiLapTech.com

fragile
HANDLE WITH CARE

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

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PIECES

CAUTION
STATIC SENSITIVE
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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.

USB camera module

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.

KLT Strength

Powerful Factory

Professional Service

Promised Delivery