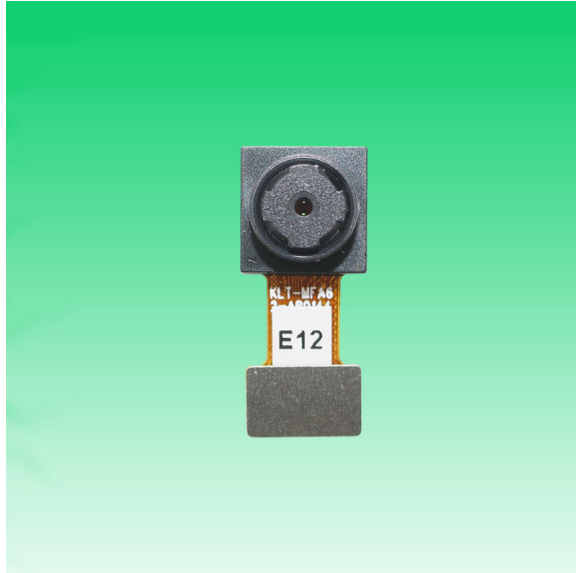


KLT-MFA62-AR0144 V1.0

**1MP OnSemi AR0144 Global Shutter MIPI Interface
Fixed Focus Camera Module**



Front View



Back View

Specifications

Camera Module No.	KLT-MFA62-AR0144 V1.0
Resolution	1MP
Image Sensor	AR0144 Global Shutter
Sensor Type	1/4"
Pixel Size	3.0 μm x 3.0 μm
EFL	3.29 mm
F.NO	2.80
Pixel	1280 x 800
View Angle	68.7°(DFOV) 58.1°(HFOV) 45.0°(VFOV)
Lens Dimensions	8.50 x 8.50 x 4.90 mm
Module Size	19.57 x 8.50 mm
Module Type	Fixed Focus
Interface	MIPI
Auto Focus VCM Driver IC	None
Lens Type	650nm IR Cut
Operating Temperature	-40°C to +85°C
Mating Connector	DF30FC-30DS-0.4V

KLT-MFA62-AR0144 V1.0

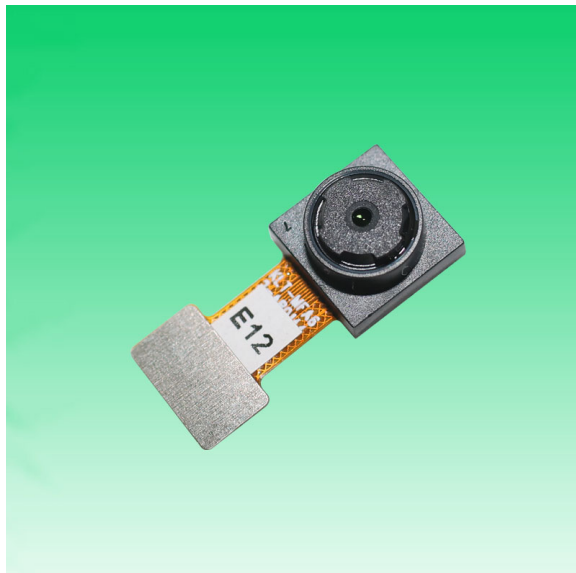
**1MP OnSemi AR0144 Global Shutter MIPI Interface
Fixed Focus Camera Module**



Top View



Side View



Bottom View



Mating Connector



Periodic table of Elements

Legend:

- Hydrogen (Gas)
- Alkali Metals
- Alkaline Earth Metals
- Transition Metals
- Other Metals
- Metalloids
- Non-metals
- Halogens
- Noble Gases
- Lanthanides
- Actinides

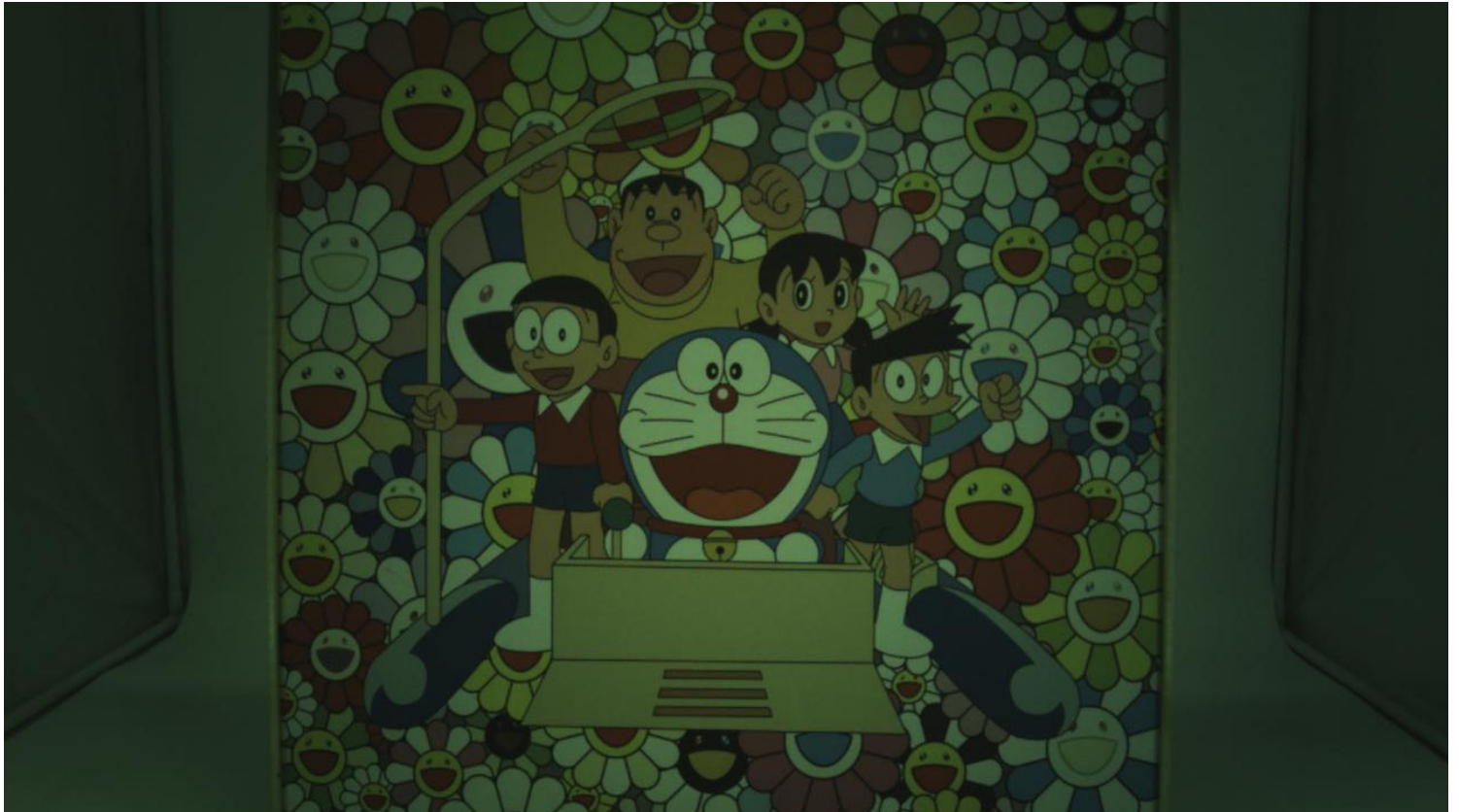
Average Atomic Mass: 6,941

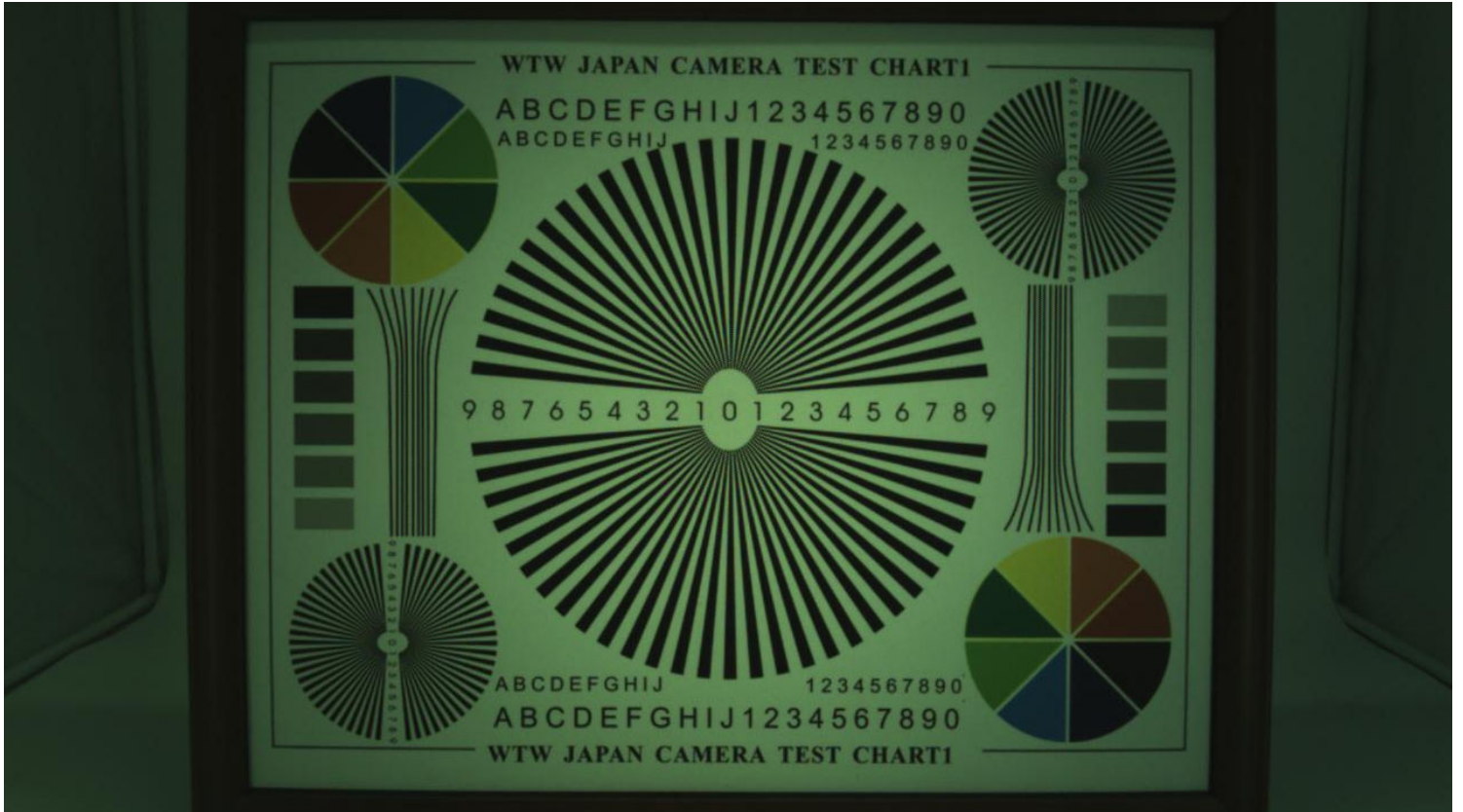
Atomic Number: 3

Name: Lithium

Symbol: Li

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
H Hydrogen 1.008	He Helium 4.002	Li Lithium 6.941	Be Beryllium 9.012	B Boron 10.81	C Carbon 12.01	N Nitrogen 14.01	O Oxygen 15.99	F Fluorine 18.98	Ne Neon 20.18	Na Sodium 22.99	Mg Magnesium 24.31	Al Aluminum 26.98	Si Silicon 28.08	P Phosphorus 30.97	S Sulfur 32.07	Cl Chlorine 35.45	Ar Argon 39.95
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
K Potassium 39.09	Ca Calcium 40.08	Sc Scandium 44.96	Ti Titanium 47.87	V Vanadium 50.94	Cr Chromium 51.99	Mn Manganese 54.94	Fe Iron 55.85	Co Cobalt 58.93	Ni Nickel 58.69	Cu Copper 63.55	Zn Zinc 65.39	Ga Gallium 69.72	Ge Germanium 72.61	As Arsenic 74.92	Se Selenium 78.96	Br Bromine 79.90	Kr Krypton 83.80
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Rb Rubidium 85.47	Sr Strontium 87.62	Y Yttrium 88.91	Zr Zirconium 91.22	Nb Niobium 92.91	Mo Molybdenum 95.94	Tc Technetium 97	Ru Ruthenium 101.1	Rh Rhodium 102.9	Pd Palladium 106.4	Ag Silver 107.9	Cd Cadmium 112.4	In Indium 114.8	Sn Tin 118.7	Sb Antimony 121.8	Te Tellurium 127.6	I Iodine 126.9	Xe Xenon 131.3
55	56	57-71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs Cesium 132.9	Ba Barium 137.3	La Lanthanum (71)	Hf Hafnium 178.5	Ta Tantalum 180.9	W Tungsten 183.8	Re Rhenium 186.2	Os Osmium 190.2	Ir Iridium 192.2	Pt Platinum 195.1	Au Gold 196.9	Hg Mercury 200.6	Tl Thallium 204.4	Pb Lead 207.2	Bi Bismuth 208.9	Po Polonium (209)	At Astatine (210)	Rn Radon (222)
87	88	89-103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Fr Francium (223)	Ra Radium (226)	Ac Actinium (89)	Rf Rutherfordium (261)	Db Dubnium (262)	Sg Seaborgium (263)	Bh Bohrium (264)	Hs Hassium (265)	Mt Meitnerium (268)	Ds Darmstadtium (281)	Rg Roentgenium (280)	Cn Copernicium (285)	Nh Nihonium (284)	Fl Flerovium (289)	Mc Moscovium (288)	Lv Livermorium (293)	Ts Tennessine (294)	Og Oganesson (294)
57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
La Lanthanum 138.9	Ce Cerium 140.1	Pr Praseodymium 140.9	Nd Neodymium 144.2	Pm Promethium 145	Sm Samarium 150.4	Eu Europium 151.9	Gd Gadolinium 157.2	Tb Terbium 158.9	Dy Dysprosium 162.5	Ho Holmium 164.9	Er Erbium 167.2	Tm Thulium 168.9	Yb Ytterbium 173	Lu Lutetium 174.9	75	76	77
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106
Ac Actinium (227)	Th Thorium (232)	Pa Protactinium (231)	U Uranium (238)	Np Neptunium (237)	Pu Plutonium (239)	Am Americium (243)	Cm Curium (247)	Bk Berkelium (247)	Cf Californium (251)	Es Einsteinium (252)	Fm Fermium (257)	Md Mendelevium (258)	No Nobelium (259)	Lr Lawrencium (260)	107	108	109



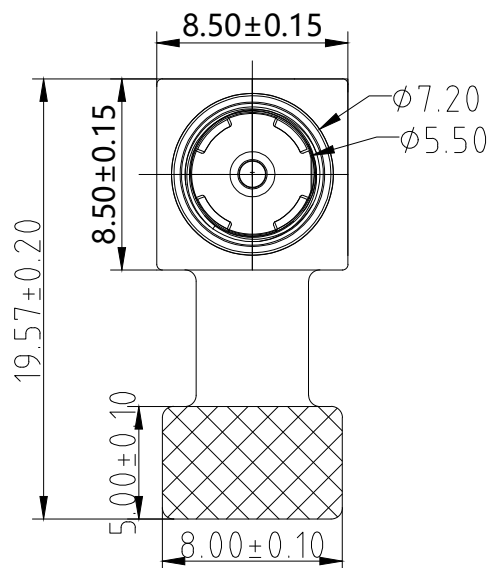


RoHS

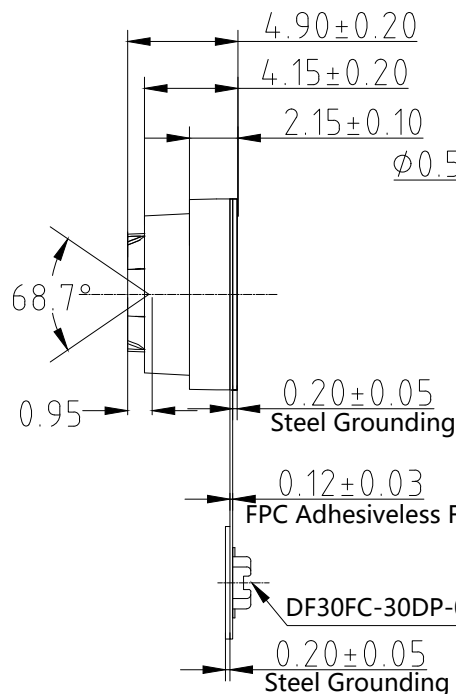
PIN	SIGNAL
1	NC
2	NC
3	DVDD 1.2V
4	DOVDD 1.8V
5	NC
6	AGND
7	AVDD 2.8V
8	DGND
9	SDA
10	SCL
11	RESET_BAR
12	NC
13	GND
14	MCLK
15	GND
16	NC
17	NC
18	GND
19	NC
20	NC
21	GND
22	MDP2
23	MDN2
24	GND
25	MCP
26	MCN
27	GND
28	MDP1
29	MDN1
30	GND

1280

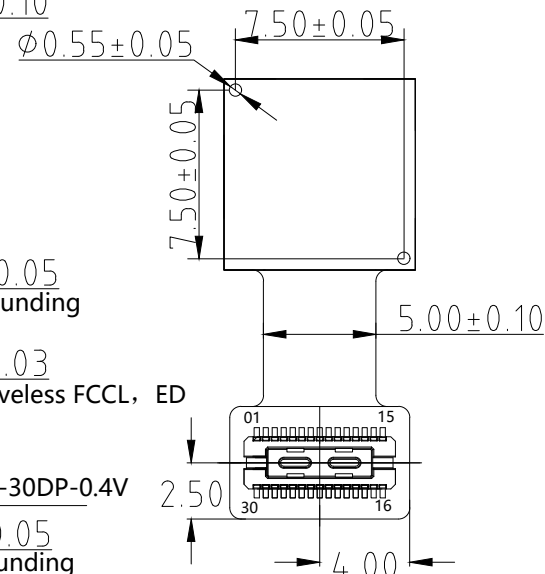
800



TOP VIEW



SIDE VIEW



BOTTOM VIEW

NOTE:

1.Sensor I2C slave address:0x20

Parameters:

1、Sensor specification:

Image Sensor: AR0144CSSC20SUKA0-CRBR

Pixel: 3um×3um

Lens Type: 1/4

Important Voltage Description: DVDD1.2V
(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

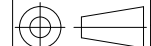
Model Name:

KLT-MFA62-AR0144 V1.0

Checked By

Jacky

Projection Type:



Third Angle

Unit:

mm

Scale:

1:1

Date:

10/15/2024

Sheet:

1 of 1

Version:

1/0

Product Overview

AR0144CS: CMOS Image Sensor, Digital, Global Shutter, 1.0 MP, 1/4-Inch

For complete documentation, see the [data sheet](#).

The AR0144 is a 1/4-inch 1.0 Mp CMOS digital image sensor with an active-pixel array of 1280H x 800V. It incorporates a new innovative global shutter pixel design optimized for accurate and fast capture of moving scenes. 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 AR0144 produces extraordinarily clear, sharp digital pictures, and its ability to capture both continuous video and single frames makes it the perfect choice for a wide range of applications, including scanning and industrial inspection.

Features

- Best Global Shutter Efficiency
- Low Dark Current/Hot Pixels
- High Linear Full Well
- Low Operational Power
- Small Form Factor

Benefits

- Improved image quality for fast moving objects
- Total Noise Floor Reduction, SNR Improvement
- High Dynamic Range
- Ideal for battery powered applications
- Ideal for space constrained applications like Handheld Scanners

Applications

- Barcode Scanning
- 3D Scanning
- Virtual/Augmented Reality
- Positional Tracking
- Gesture Recognition

End Products

- Barcode Scanners
- Head Mounted Displays
- Biometric Scanners
- Virtual Reality/Augmented Reality Glasses
- Drones

Part Electrical Specifications

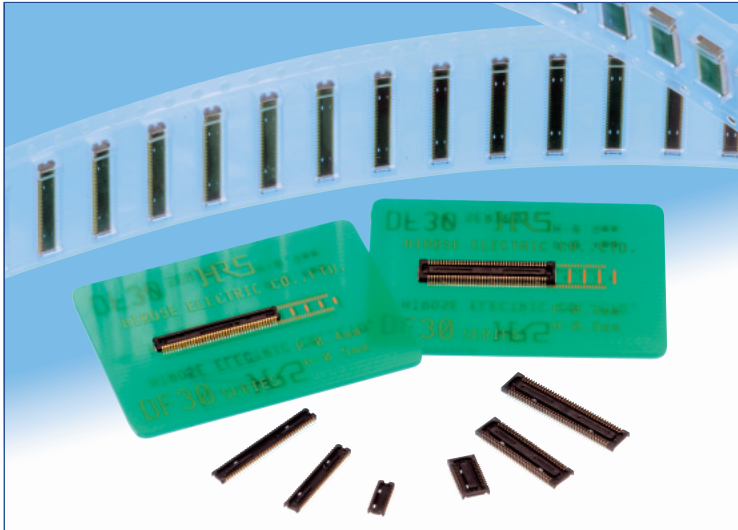
Product	Pricing (\$/Unit)	Compliance	Status	Type	Megapixels	Frame Rate (fps)	Optical Format	Shutter Type	Pixel Size (µm)	Output Interface	Color	Package Type
AR0144CSSC00SUD20		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	RGB	
AR0144CSSC00SUKA0-CPBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	RGB	ODCSP-69
AR0144CSSC00SUKA0-CPBR1		Pb-free Halide free	Active									ODCSP-69
AR0144CSSC00SUKA0-CPBR2		Pb-free Halide free	Active									ODCSP-69
AR0144CSSC00SUKA0-CRBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	RGB	ODCSP-69
AR0144CSSC00SUKA0-CRBR1		Pb-free Halide free	Active									ODCSP-69
AR0144CSSC20SUD20		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	RGB	
AR0144CSSC20SUKA0-CPBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	RGB	ODCSP-69
AR0144CSSC20SUKA0-CRBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	RGB	ODCSP-69
AR0144CSSM00SUD20		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	
AR0144CSSM00SUKA0-CPBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	ODCSP-69
AR0144CSSM00SUKA0-CPBR1		Pb-free Halide free	Active									ODCSP-69
AR0144CSSM00SUKA0-CPBR2		Pb-free Halide free	Active									ODCSP-69
AR0144CSSM00SUKA0-CRBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	ODCSP-69
AR0144CSSM20SUD20		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	
AR0144CSSM20SUKA0-CPBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	ODCSP-69
AR0144CSSM20SUKA0-CPBR1		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	ODCSP-69
AR0144CSSM20SUKA0-CRBR		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	ODCSP-69
AR0144CSSM20SUKA0-CRBR1		Pb-free Halide free	Active	CMOS	1MP	60	1/4 inch	Global Shutter	3.0 x 3.0	Multi	Mono	ODCSP-69
AR0144CSSM28SUD20		Pb-free Halide free	Active	CMOS	1MP	60	1/4 Inch	Global Shutter	3.0 x 3.0	Multi	Mono	
AR0144CSSM28SUKA0-CPBR		Pb-free Halide free	ProductP review									ODCSP-69

For more information please contact your local sales support at www.onsemi.com.

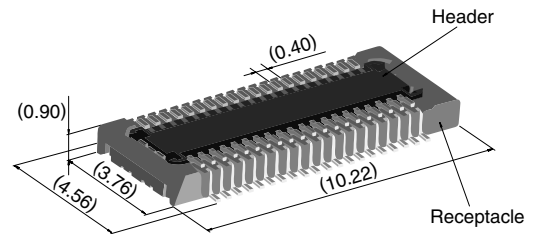
Created on: 6/17/2020

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

DF30 Series



Extremely small size



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 dimensions of 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.

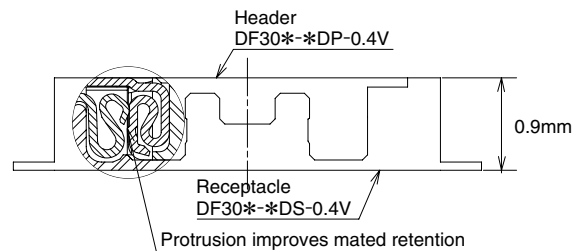
Applications

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

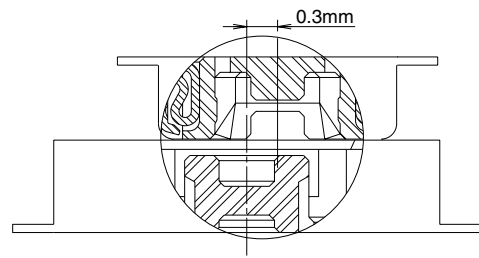
Low profile

Increased mated retention

High contact reliability



Self alignment



■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-copper plated	————

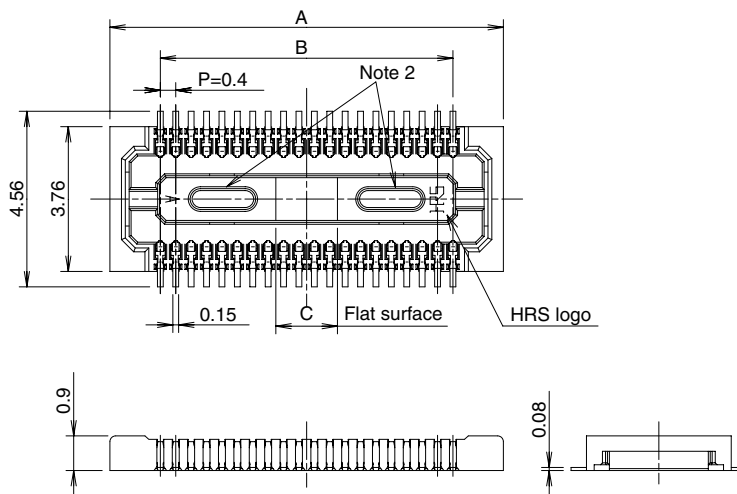
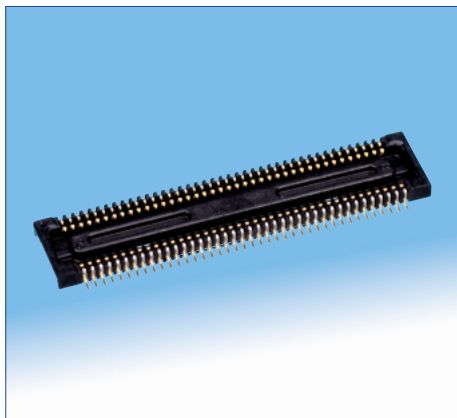
■Ordering information

●Receptacles and Headers

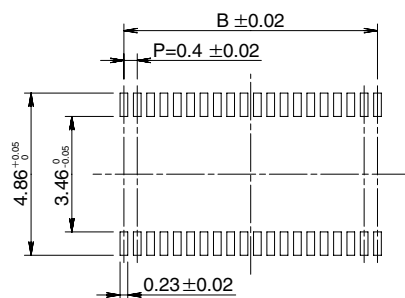
DF30 FC - * DS - 0.4 V (**)
 ① ② ③ ④ ⑤ ⑥ ⑦

① Series name: DF30	⑤ Contact pitch: 0.4 mm
② Configuration FB: With metal fittings, without bosses FC: Without metal fittings, without bosses CJ: Connector for conductivity tests	⑥ Termination section V: Straight SMT
③ Number of positions: 20, 22, 24, 30, 34, 40, 50, 60, 70, 80	⑦ Packaging (81): Embossed tape packaging (5,000 pieces per reel) (82): Embossed tape packaging (1,000 pieces per reel)
④ Connector type DS: Double row receptacle DP: Double row header	

■Receptacles (without metal fittings)



◆Recommended PCB mounting pattern



Recommended solder paste thickness: 120 μ m

[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



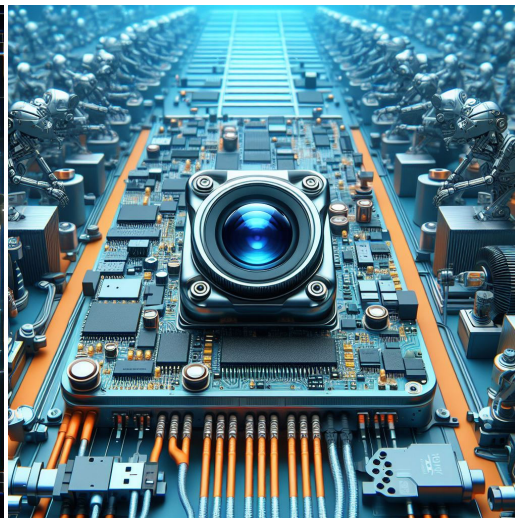
Live Streaming



Video Conference



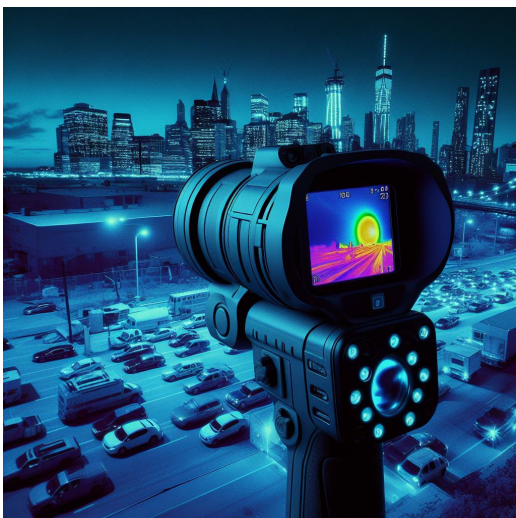
Eye Tracker Biometric Detection



Machine Vision



Agricultural Monitor



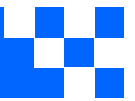
Night Vision Security



Drone and Sports Eagle Eyes



Interactive Pet Camera



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
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

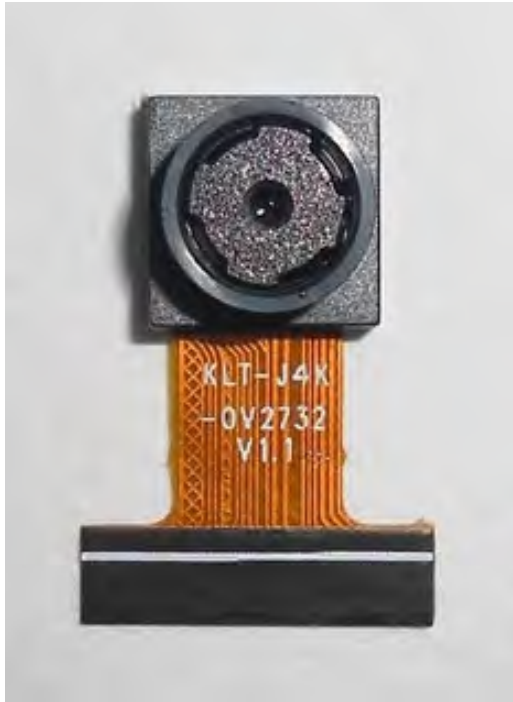
Reliability Inspection Item			Testing Method	Acceptance Criteria
Category		Item		
Environmental	Storage Temperature	High 60°C 96 Hours	Temperature Chamber	No Abnormal Situation
		Low -20°C 96 Hours	Temperature Chamber	No Abnormal Situation
	Operation Temperature	High 60°C 24 Hours	Temperature Chamber	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	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

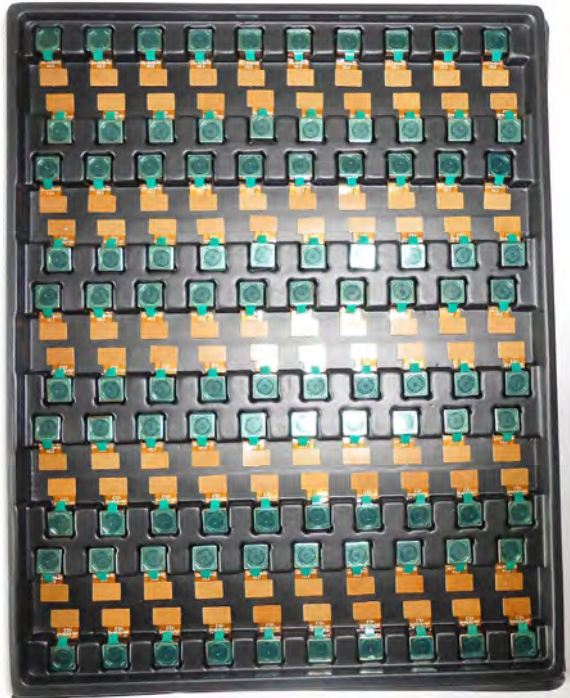


Place Cameras on the Tray



Camera Modules Package Solution

Full Tray of Cameras



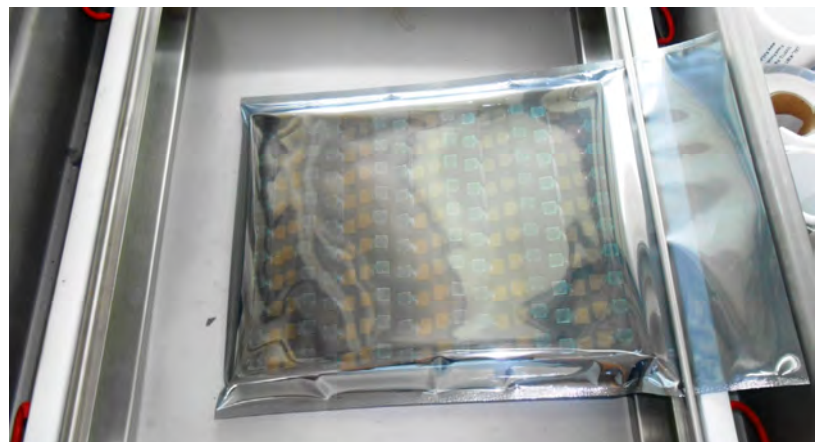
Cover Tray with Lid



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



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

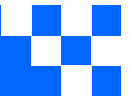


The Wheel is Perfectly Fitting the Box



Connectors Box Ready for Shipment

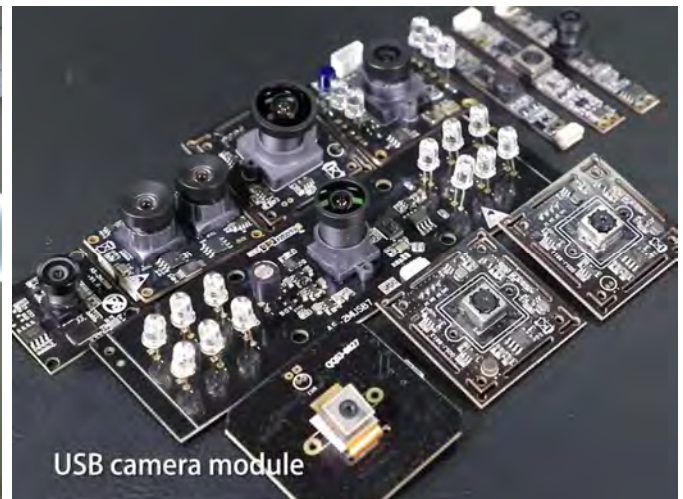


**Company Kai Lap Technologies (KLT)**

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.





CMOS CAMERA MODULES



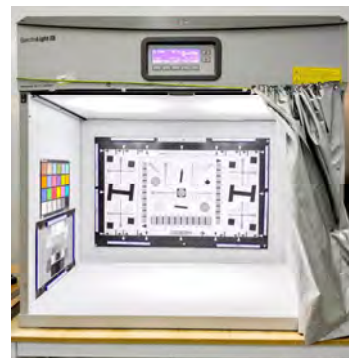
your BEST camera module partner

KLT Strength

Powerful Factory



Professional Service



Promised Delivery



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