

KLT-OV13850-L55B V2.2

13MP OmniVision OV13850 MIPI Interface Auto Focus Camera Module



Front View



Back View

Specifications

Camera Module No.	KLT-OV13850-L55B V2.2
Resolution	13MP
Image Sensor	OV13850
Sensor Type	1/3.06"
Pixel Size	1.12 um x 1.12 um
EFL	3.85 mm
F.NO	2.20
Pixel	4224 x 3136
View Angle	74.4°(DFOV) 62.7°(HFOV) 48.7°(VFOV)
Lens Dimensions	8.50 x 8.50 x 5.60 mm
Module Size	20.00 x 8.50 mm
Module Type	Auto Focus
Interface	MIPI
Auto Focus VCM Driver IC	DW9714P
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +85°C
Mating Connector	GB042-30S-H10



KLT-OV13850-L55B V2.2

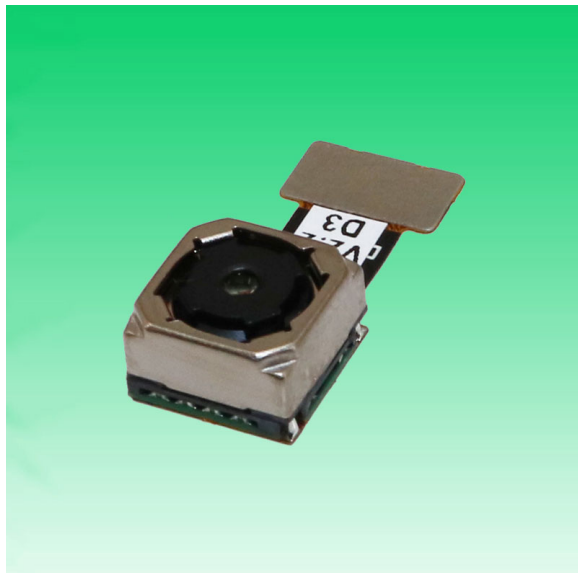
13MP OmniVision OV13850 MIPI Interface Auto Focus Camera Module



Top View



Side View



Bottom View

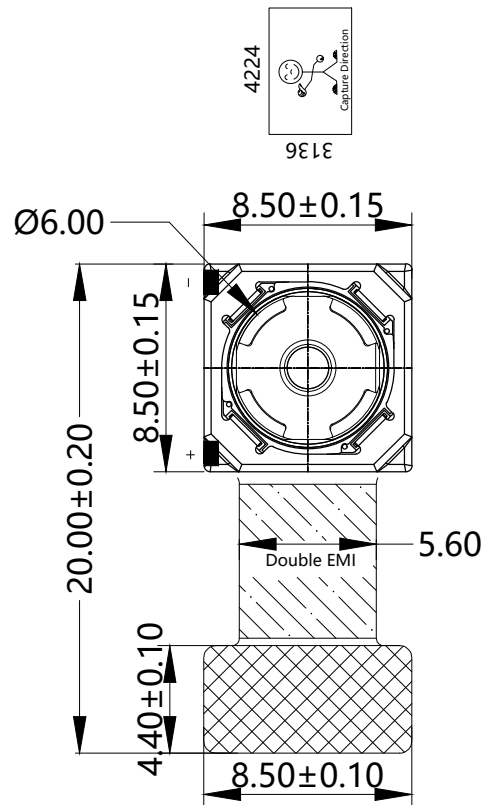


Mating Connector

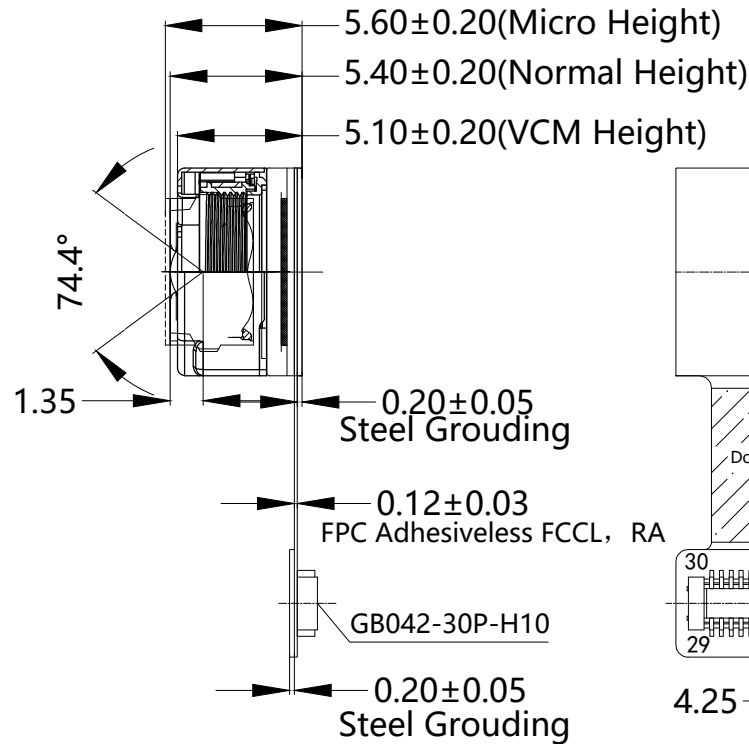
RoHS

1	DGND
2	DGND
3	DGND
4	XSHUTDOWN(RST)
5	VDD_VCM 2.8V
6	PWDN_VCM
7	SDA
8	DOVDD 1.8V
9	SCL
10	DVDD 1.2V
11	DGND
12	PWDN (Sensor)
13	CLK_N
14	NC
15	CLK_P
16	DGND
17	DATA0_N
18	MCLK
19	DATA0_P
20	DGND
21	DATA1_N
22	Flash(XVS)
23	DATA1_P
24	AVDD2.8V
25	NC
26	AGND
27	DATA2_N
28	DATA3_N
29	DATA2_P
30	DATA3_P

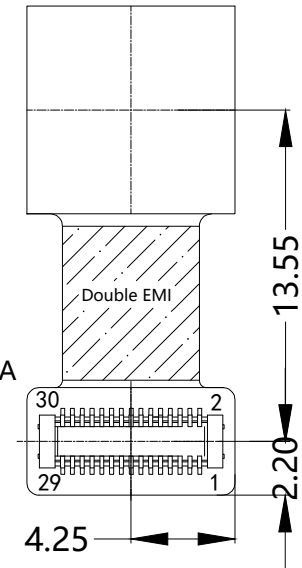
Version	Information	Date
V1.0	First Version	9-6-2017
V2.0	Change the layout and VCM	10-26-2017
V2.2	Change VCM	2-15-2023



TOP VIEW



SIDE VIEW



BOTTOM VIEW

NOTE:

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

Parameters:

1、 Sensor specification:
 Image Sensor: OV13850_R2A
 Pixel: 1.12um*1.12um
 Lens Type: 1/3.06
 Important Voltage Description:
 DVDD1.2V (external power supply);

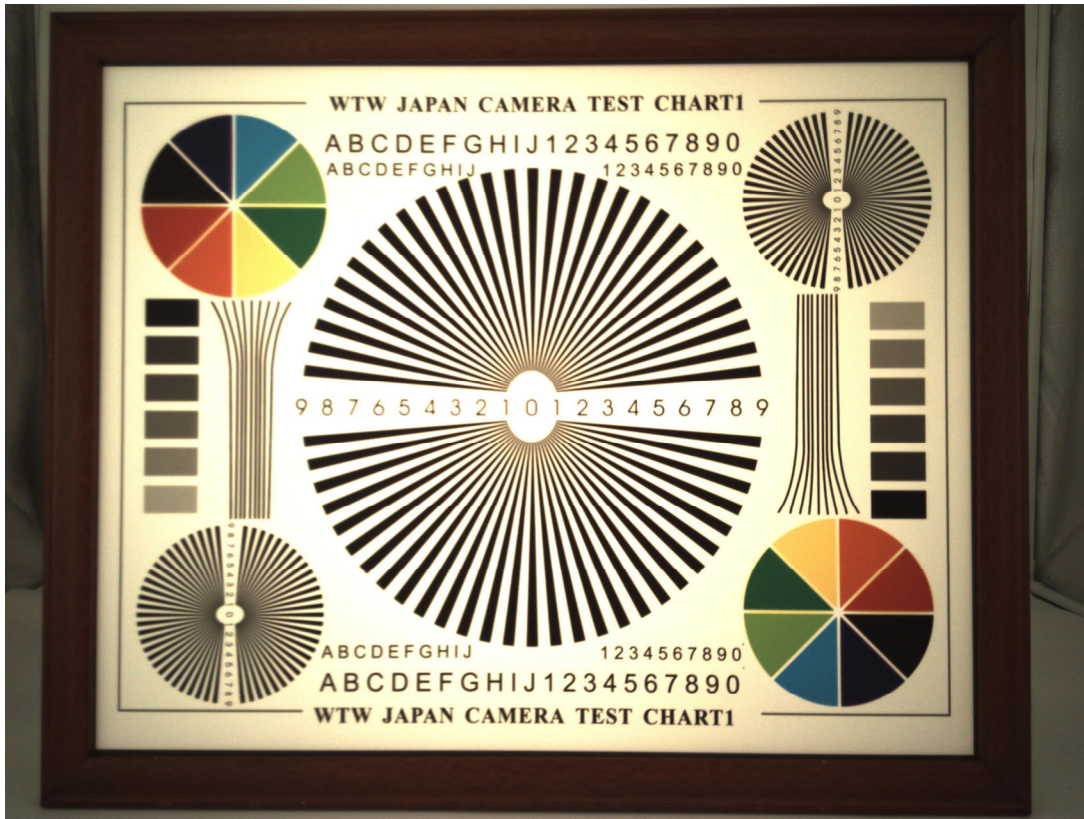
2、 Lens specification:
 FOV: 74.4°(D);62.7°(H);48.7°(V);
 F/NO.: 2.2
 TV distortion: <1.5%
 Focal length: 3.85mm
 Composition: 5P+IR FILTER
 IR Cut Coating: 650nm±10nm@50%

Kai Lap Technologies Group Ltd

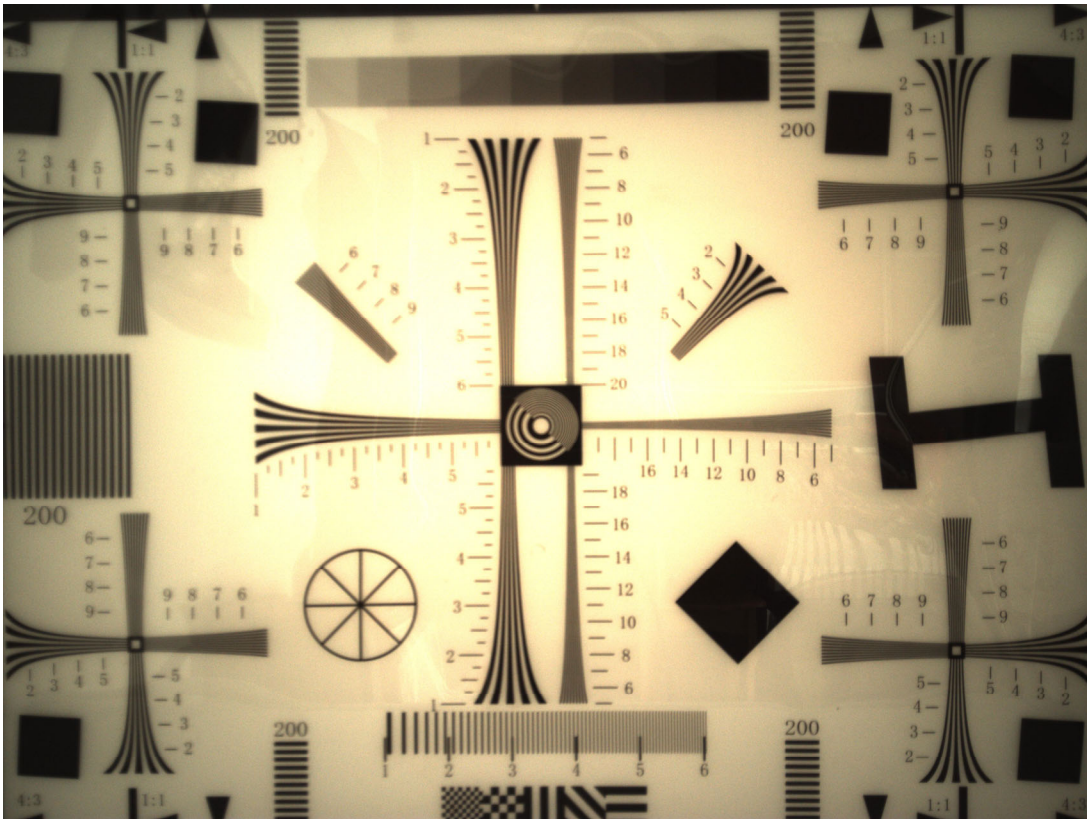
Designed By	Kevin	Model Name:	KLT-OV13850-L55B V2.2		
Checked By	Aouly_Yan	Projection Type:	Unit:	Material:	
			mm	-----	
		Scale:	Sheet:	Version:	
		1:1	1 of 1	1/0	

Real Test Images

OV13850-L55B V2.2

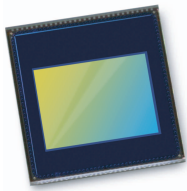


Real Test Images
OV13850-L55B V2.2



Real Test Images
OV13850-L55B V2.2





OV13850 13MP product brief



Power-Efficient 13-Megapixel Image Sensor with Best-In-Class Performance for High-End Smartphones and Tablets



available in a lead-free package

The OV13850 is a high performance PureCel™ 13-megapixel CameraChip™ sensor that delivers best-in-class high- and low-light performance, as well as dramatically reduced power consumption for smartphones and tablets.

The OV13850 sensor offers a number of performance enhancements, including improved full-well capacity (FWC) and sensitivity for industry-leading high- and low-light performance. It also offers a 40 percent reduction in power consumption compared to our previous generation sensor, making the OV13850 ideally suited for feature-rich mobile devices.

The 1/3.06-inch OV13850 supports an active array of 4224 x 3136 pixels (13.2-megapixels) operating at 30 frames per second (fps) for zero shutter lag and can seamlessly transition between recording video and capturing still images. Additionally, the sensor supports 4K2K ultra-high definition video at 30 fps with full-horizontal field of view (FOV) and electronic image stabilization (EIS), as well as high frame rate 1080p HD video at 60 fps with EIS to enable high quality videos.

The OV13850 fits into an industry standard 8.5 x 8.5 x 5 mm module.

Find out more at www.ovt.com.

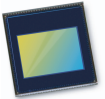
Applications

- Cellular Phones
- Tablets
- PC Multimedia

Product Features

- PureCel™ image sensor
- 1.12 μm x 1.12 μm pixel
- optical size of 1/3.06"
- 31.2° CRA for $\pm 6\text{ mm}$ z-height
- programmable controls for frame rate, mirror and flip, cropping, and windowing
- support for image sizes: 13.2MP (4224x3136), 10MP (16:9 - 4224x2376), 4K2K (3840x2160), EIS 1080p (2112x1188), EIS 720p (1408x792), and more
- 13.2MP at 30 fps
- two-wire serial bus control (SCCB)
- strobe output to control flash
- 8 kbits of embedded one-time programmable (OTP) memory
- two on-chip phase lock loops (PLLs)
- programmable controls: gain, exposure, frame rate, image size, horizontal mirror, vertical flip, cropping, and panning
- image quality controls: defect pixel correction, automatic black level calibration, lens shading correction, and alternate row HDR
- built-in temperature sensor
- suitable for module size of 8.5 x 8.5 x $\pm 6\text{ mm}$

OV13850



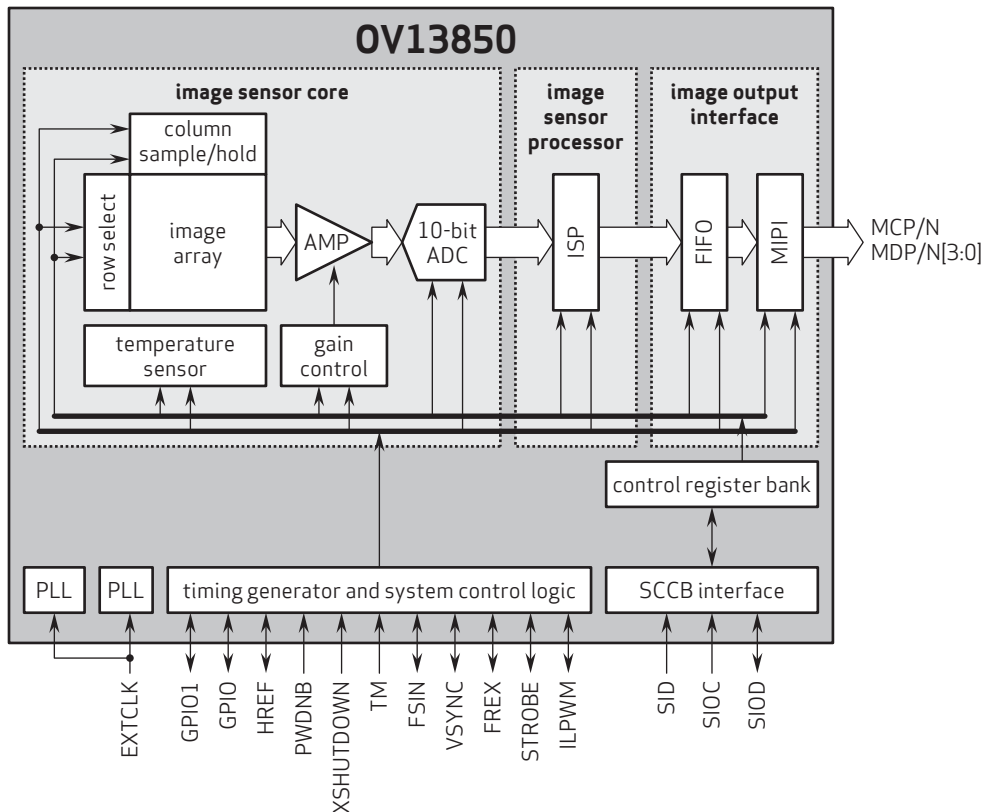
Ordering Information

- OV13850-G04A**
(color, chip probing, 200 μm backgrinding, reconstructed wafer with good die)

Product Specifications

- active array size:** 4224 x 3136
- power supply:**
 - core: 1.14 - 1.26V (1.2V nominal)
 - analog: 2.6 - 3.0V (2.8V nominal)
 - I/O: 1.7 - 3.0V (1.8V or 2.8V nominal)
- power requirements:**
 - active: 223 mW
 - standby: 300 μW
 - XSHUTDOWN: 1 μW
- temperature range:**
 - operating: -30°C to +85°C junction temperature
 - stable image: 0°C to +60°C junction temperature
- output interfaces:** up to 4-lane MIPI serial output
- output formats:** 10-bit RGB RAW
- lens size:** 1/3.06"
- lens chief ray angle:** 31.2°
- input clock frequency:** 6 - 64 MHz
- maximum image transfer rate:** 30 fps
- scan mode:** progressive
- pixel size:** 1.12 μm x 1.12 μm
- image area:** 4815 μm x 3678.3 μm
- die dimensions:** 6210 μm x 5517 μm

Functional Block Diagram



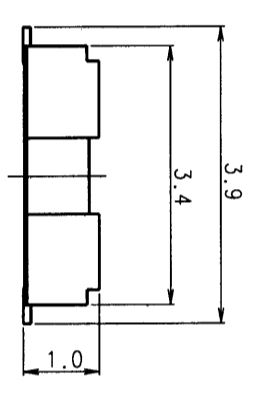
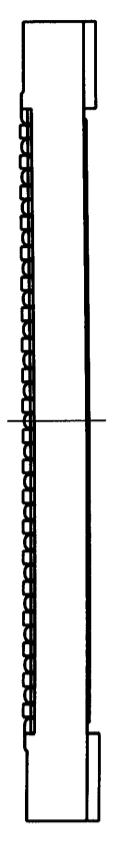
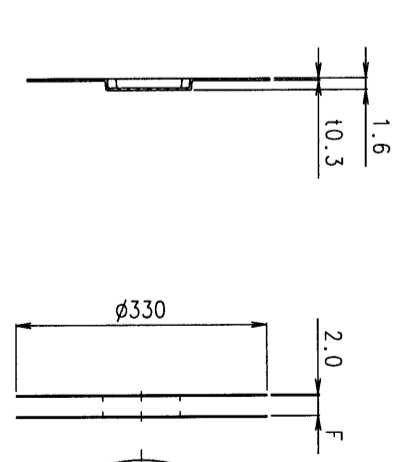
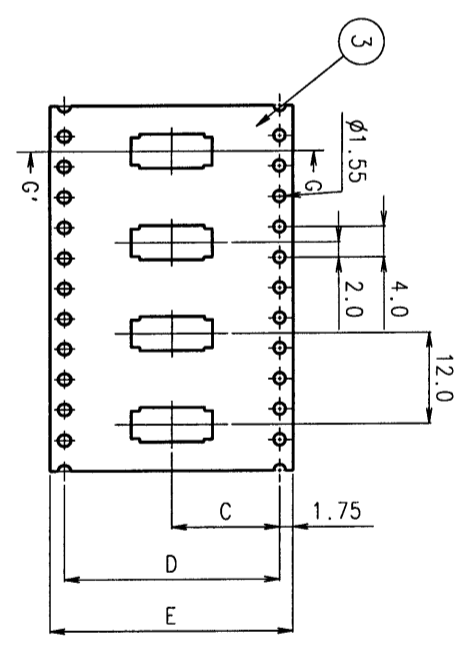
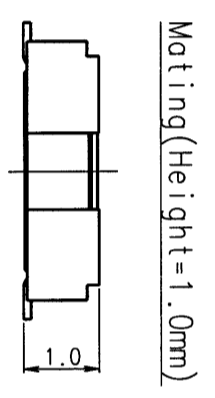
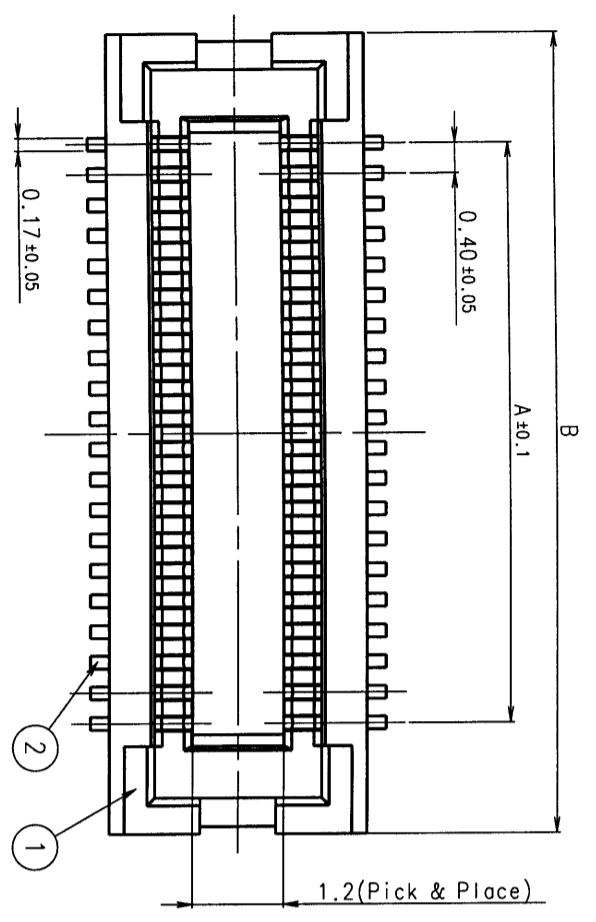
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OmniVision

REV. NO	DATE	DCN. NO	REMARKS	DES'D	CHE'D	APP'D



Recommended PCB Lay-Out

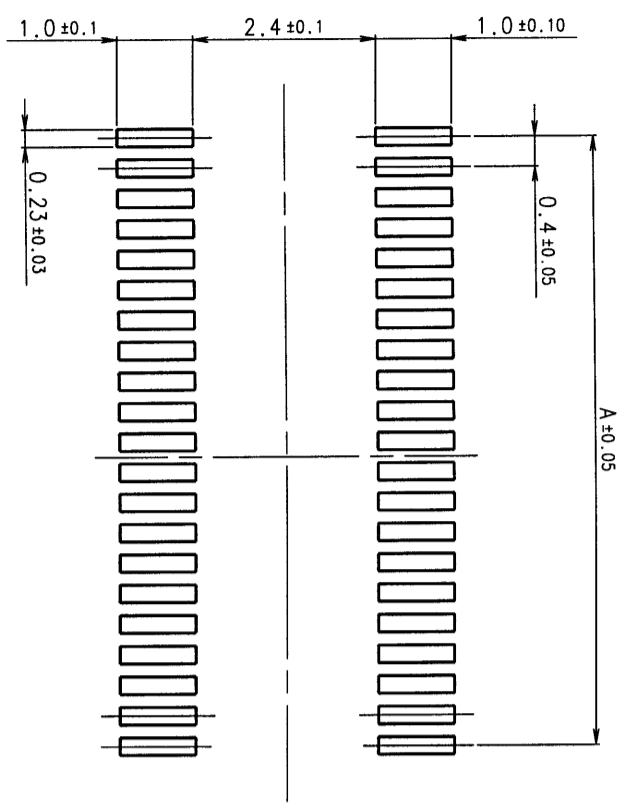


Table-1

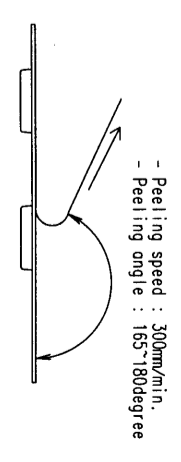
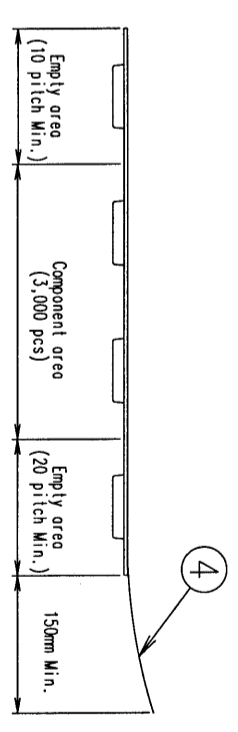
No. of Positions	A	B	C	D	E	F
20	3.6	6.5	7.5	—	16.0	18.0
24	4.4	7.3	—	—	—	—
30	5.6	8.5	—	—	—	—
34	6.4	9.3	—	—	—	—
40	7.6	10.5	11.5	—	24.0	26.0
50	9.6	12.5	—	—	—	—
54	10.4	13.3	—	—	—	—
60	11.6	14.5	—	—	—	—
70	13.6	16.5	14.2	28.4	32.0	34.0
80	15.6	18.5	—	—	—	—

UNIT - mm
 GENERAL TOLERANCES:
 DIMENSION . X ± 0.2
 . XX ± 0.1
 ANGLES X . X

REFERENCE DOCUMENT	DATE	SCALE	SIZE
LGCC(25)-K-AS118	Mar. 31. 2005	10/1	A3
MATERIAL	DESIGNED	TITLE	
	K.C. Park	GB042 Receptacle	
TREATMENT	CHECKED	(GB042-**S-H10)	
FINISH	APPROVED	SERIES	SHEET
	D.H. Kim	GB042	1 / 1
		DWG. NO	
		GUS511802	

ITEM	DESCRIPTION	Q'TY	MATERIAL	FINISH	REMARKS
1	Recep. Insulator	1	Engineering Plastic	-	UL94V-0
2	Recep. Contact	n	Copper Alloy	Au over Ni	-
3	Carrier Tape	1	Polyester or Polystyrene	-	-
4	Cover Tape	1	Polyester or Polystyrene	-	-
5	Bobbin	1	Plastic	-	-

4. Co-Planarity of contacts is 0.1mm Max.



[NOTE] 1. Ordering Information

GB042 - ** S - H10 - E3000

No of _____ Receptacle _____ 3,000pcs/Plastic reel

2. Packing Specification

3. Peel strength : 10~70g

Carrier Tape(S=1/1)

SEC. G-G'

Bobbin(S=1/10)



555, Hoeye-Dong, Anyang-Si
 Kyungki-Do, 430-080, KOREA

GB042 series

0.4mm pitch PCB to PCB Connector

GB042 series | Receptacle & Embossed Tape Assembly



Features

- GB042 series Connector is 0.4 mm pitch, low profile PCB to PCB SMT type connector.
- Improved contact reliability with plug and receptacle contacting at 2 point simultaneously.
- Stable unmating mechanism preventing receptacle contact from being deformed.

Applications

- Mobile phone
- Compact portable devices, etc

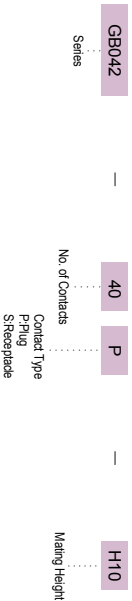
Materials & Finishes

Parts	Materials / Finishes
Insulator	Heat Resistant Plastic UL94V-0
Contact	Plug Copper Alloy
	Recept. Copper Alloy
	AU Plating Au Plating

Specifications

No. of Contacts	10-80
Stacking Height	1.0mm
Contact Spacing	0.4mm
Current Rating	AC, DC 0.3A/pin
Voltage Rating	AC, DC 50V
Dielectric Withstanding Voltage	AC 250V (r.m.s for one minute)
Insulation Resistance	1000MΩ
Contact Resistance	70mΩ
Operating Temp.	-25°C ~ +85°C

Ordering Information

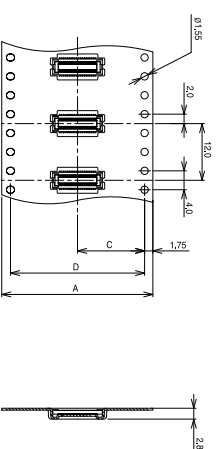
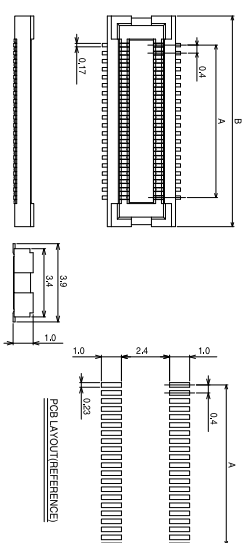
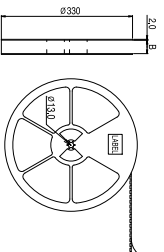


Receptacle



Embossed Tape Assembly

Bobbin



No. of Pin	Part Number	Receptacle		Embossed Tape Assembly			
		A	B	A	B	C	D
10	GB042 - 10S - * - H10 - E3000	1.6	4.5				
20	GB042 - 20S - * - H10 - E3000	3.6	6.5	16.0	18.0	7.5	-
24	GB042 - 24S - * - H10 - E3000	4.4	7.3				
28	GB042 - 28S - * - H10 - E3000	5.2	8.1				
30	GB042 - 30S - * - H10 - E3000	5.6	8.5				
34	GB042 - 34S - * - H10 - E3000	6.4	9.3				
40	GB042 - 40S - * - H10 - E3000	7.6	10.5				
44	GB042 - 44S - * - H10 - E3000	8.4	11.3	24.0	26.0	11.5	-
50	GB042 - 50S - * - H10 - E3000	9.6	12.5				
54	GB042 - 54S - * - H10 - E3000	10.4	13.3				
60	GB042 - 60S - * - H10 - E3000	11.6	14.5				
64	GB042 - 64S - * - H10 - E3000	12.4	15.3	32.0	34.0	14.2	28.4
70	GB042 - 70S - * - H10 - E3000	13.6	16.5				



Cameras Applications



Automotive Driver Pilot



Live Streaming



Video Conference



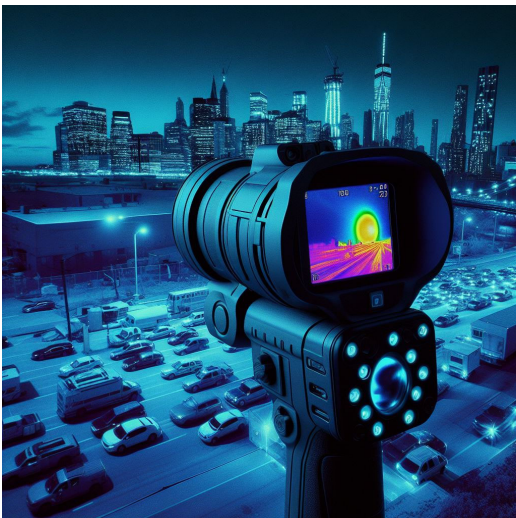
Eye Tracker Biometric Detection



Machine Vision



Agricultural Monitor



Night Vision Security



Drone and Sports Eagle Eyes

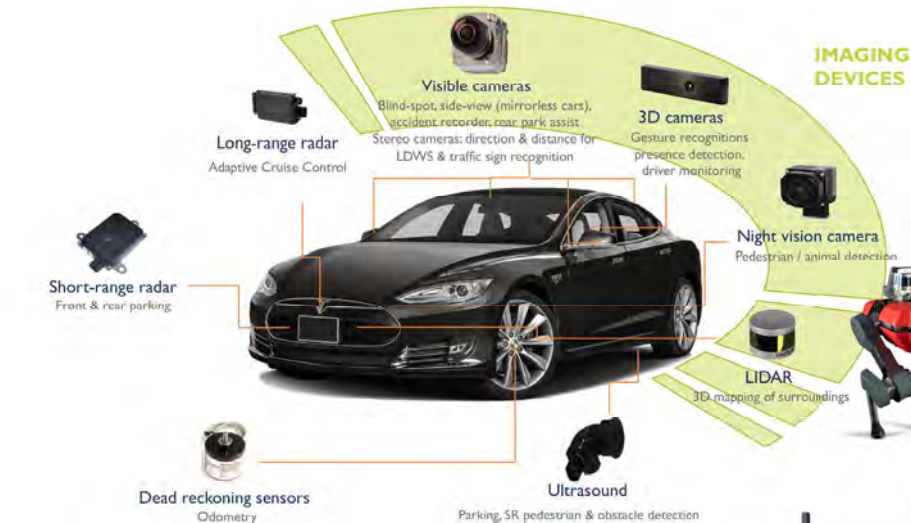


Interactive Pet Camera



your **BEST** camera module partner

Cameras Applications





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
FREQ										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



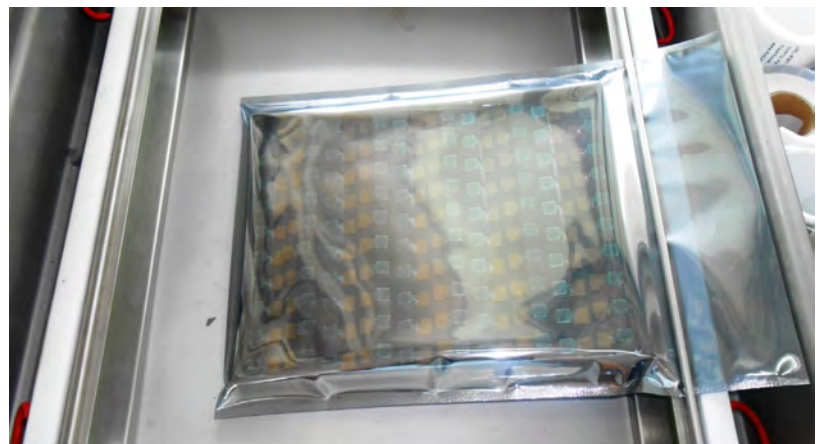
Cover Tray with Lid



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





your BEST camera module partner

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



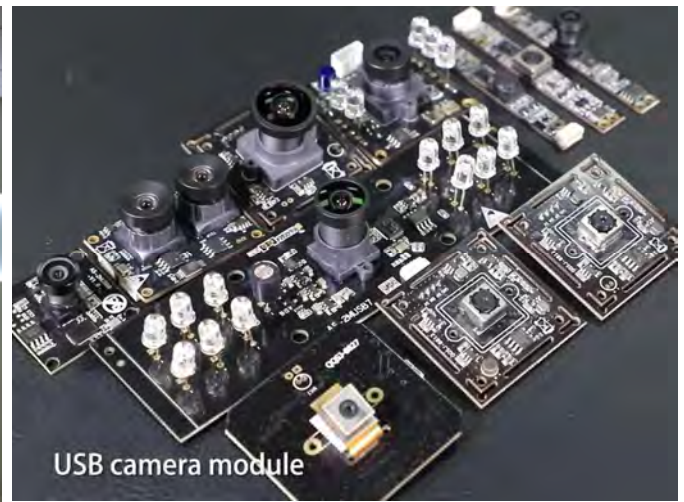


Company Kai Lap Technologies (KLT)

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.





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