YDS-OIS-FF-OV4688 V2.0
4MP OmniVision OV4688 OIS MGS MIPI Interface Fixed Focus Camera Module

Camera Module No.	YDS-OIS-FF-OV4688 V2.0
Resolution	4MP
Image Sensor	OV4688 w/ MGS OIS
Sensor Type	1/3"
Pixel Size	2.0 um x 2.0 um
EFL	2.30 mm
F.NO	2.40
Stabilization Method	Optical Image Stabilization (OIS)
Stabilizer Type	Micro Gimbal Stabilizer (MGS)
Stabilizer Axis No.	2 Axis (Pitch and Yaw)
Stabilizer Angle	Max. 4.5°
Stabilizer Power	180 mW
Pixel	2688 x 1520
View Angle	117°(DFOV)
Lens Dimensions	19.00 x 19.00 x 9.90 mm
Module Type	Fixed Focus
Lens Barrel	M8.0 x P0.5
Interface	MIPI
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +85°C
Mating Connector	BAF04-30083-0500

YDS-OIS-FF-OV4688 V2.0
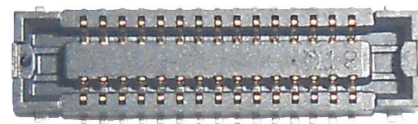## 4MP OmniVision OV4688 OIS MGS MIPI Interface Fixed Focus Camera Module
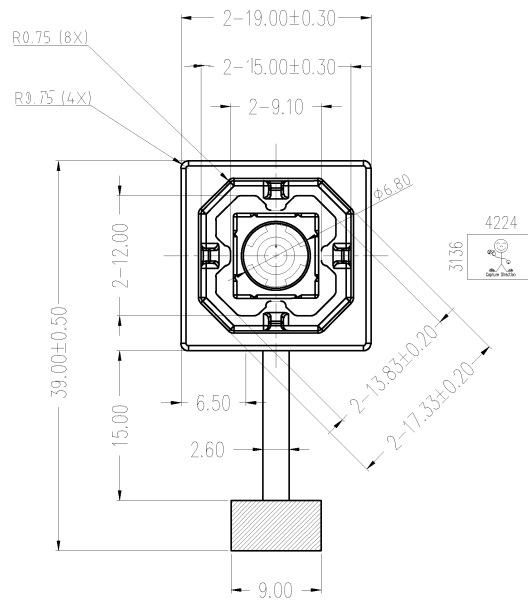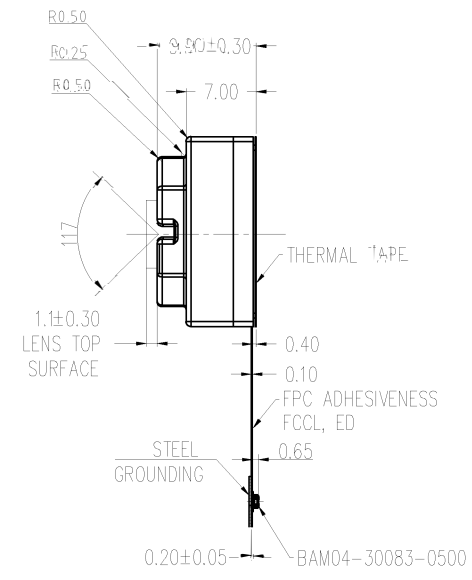
Top View

Side View

Bottom View

Mating Connector

Version	Information	Date
V2.0	First Version	7-21-2023

RoHS

PIN	SIGNAL
1	VCM_GND
2	VCM_GND
3	VCM_3.3V
4	SDA
5	SCL
6	MIPI_GND
7	MCN
8	MCP
9	MDN0
10	MDP0
11	MDN1
12	MDP1
13	NC
14	MDN2
15	MDP2
16	MDN3
17	MDP3
18	AGND
19	AVDD_2.8V
20	VCM_3.3V
21	DGND
22	MCLK
23	DGND
24	NC
25	PWDN(XCLR)
26	DVDD_1.2V
27	VDDIO_1.8V
28	Reset_N(GPIO)
29	ID
30	DGND

TOP VIEW

SIDE VIEW
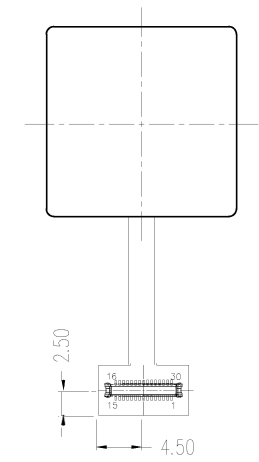
BOTTOM VIEW

Remark:

1. Sensor I2C Slave Address: 0X20(W)/0X21(R) ID=1
   0X6C(W)/0X6D(R) ID=0
2. MGS Driver I2C Slave Address: 0X52(W)/0X53(R)
3. AF Driver I2C Slave Address: 0X18(W)/0X19(R)
4. VCM_3.3V: 3.3V(+/-0.05V) during operation

5. AVDD_2.8V: 2.8V(+/-0.05V) during operation
6. Reset_N: Connected to GPIO for the purpose of MGS
   ON/OFF, the pin is internal pull high, active low (MGS OFF)
7. Tool0: NC, reserved

PARAMETERS PARAMETERS
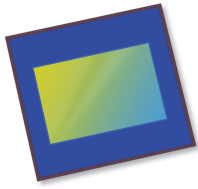
Sensor Specification
Image Sensor: OV4688
Pixel: 2.0umx2.0um
Lens Type: 1/3"
Important Voltage Description:
    VCM_3.3V: 3.3V
    AVDD_2.8V: 2.8V
    VDDIO_1.8V: 1.8V
    DVDD_1.2V: 1.2V

Lens Specification
FOV: 117° (DIAGONAL)
F/NO.:   2.4±5% (INFINITE)
TV Distortion: <-18%
Focal Length: 2.3mm
Composition: 6 elements, all plastic

DESIGNED BY	Kevin	MODEL NAME	OS-FF-OV4688 V2.0		
CHECKED BY	Aouly Yan	Projection Type: Third Angle	Unit:	Material: ---------------	
			Scale: 1:1	Sheet: 1 of 1	Version: 1.0

Lens top surface dimensions: 2-19.00±0.30, 2-15.00±0.30, 2-9.10, 39.00±0.50, 2-12.00, 15.00, 6.50, 2.60, 9.00, Ø6.80, 2-13.83±0.20, 2-17.33±0.20

Side view: 9.80±0.30, 7.00, 117, 1.1±0.30 LENS TOP SURFACE, THERMAL TAPE, 0.40, 0.10, FPC ADHESIVENESS FCCL, ED, STEEL GROUNDING, 0.65, 0.20±0.05, BAM04-30083-0500, R0.50, R0.25

Bottom view: 2.50, 4.50

R0.75 (8X), R0.75 (4X)

4224 / 3136

OV4688 4MP product brief

Native 16:9 HD 4-Megapixel CameraChip™ Sensor with High Frame Rate and Excellent Low Light Sensitivity for Next-Generation Video Applications

The OV4688 is a high-performance 4-megapixel CameraChip sensor in a native 16:9 high definition (HD) format designed to deliver ultra-high quality fast frame rate HD video for mobile devices. Built on a new 2-micron OmniBSI-2™ pixel, the OV4688 offers best-in-class low-light performance with a 40 percent increase in sensitivity compared to the 1.75-micron OmniBSI-2 pixel.

The OV4688 supports timing for two High Dynamic Range (HDR) modes, frame-based sequential HDR and line-based staggered HDR. A major advantage of staggered mode over sequential mode is a significant reduction of motion artifacts in the captured images. The sensor's enhanced performance, along with its ability to record full resolution 4MP @ 90 frames per second (fps), allows it to capture best-in-class video and high-speed photography with zero shutter lag, and video HDR at 30 fps.

The 1/3-inch OV4688 can also capture 1080p HD at 120 fps with electronic image stabilization (EIS), or 720p HD at 180 fps. The OV4688's high frame rates enable additional key benefits, including full-resolution continuous frame capture or burst photography and recording of high-quality slow-motion video.

The OV4688 features a high-speed 4-lane MIPI serial output interface to facilitate the required high data transfer rate and fits into an 8.5 x 8.5 mm module with a z-height of about 5 mm.

Find out more at www.ovt.com.

OmniVision®

Applications

- Cellular Phones
- Digital Still Cameras (DSC)
- Digital Video Camcorders (DVC)
- PC Multimedia

OV4688

Product Features

- supports staggered, sequential HDR timing
- automatic black level calibration (ABLC)
- programmable controls for frame rate, mirror and flip, cropping, and windowing
- static defective pixel canceling
- supports output formats: 10-bit RAW RGB (MIPI)
- supports horizontal and vertical subsampling
- supports images sizes: 4MP, 3MP, EIS1080p, 1080p, EIS720p
- fast mode switching
- support 2x2 binning, 4x4 binning, re-sampling filter
- standard serial SCCB interface
- up to 4-lane MIPI serial output interface
- embedded 1.5K bits one-time programmable (OTP) memory for part identification, etc
- two on-chip phase lock loops (PLLs)
- programmable I/O drive capability
- built-in temperature sensor

Product Specifications

- **active array size:** 2688 x 1520
- **power supply:**
  - **core:** 1.1 - 1.3V
  - **analog:** 2.6 - 3.0V
  - **I/O:** 1.7 - 3.0V
- **power requirements:**
  - **active:** 163 mA (261 mW)
  - **standby:** 1 mA
  - **XSHUTDOWN:** <10 µA
- **temperature range:**
  - **operating:** -30°C to +85°C junction temperature
  - **stable image:** 0°C to +60°C junction temperature
- **output formats:** 10-bit RAW RGB data
- **lens size:** 1/3"
- **input clock frequency:** 6 - 64 MHz
- **lens chief ray angle:** 31.5° non-linear

- **max S/N ratio:** 38.3 dB
- **dynamic range:** 64.6 dB @ 1x gain
- **maximum image transfer rate:**
  - **2688x1520:** 90 fps
  - **1920x1080:** 120 fps
  - **1280x720:** 180 fps
  - **672x380:** 330 fps
- **sensitivity:** 1900 mV/lux-sec
- **scan mode:** progressive
- **maximum exposure interval:** $1548 \times T_{ROW}$
- **pixel size:** 2 µm x 2 µm
- **dark current:** 4 mV/sec @ 60°C junction temperature
- **image area:** 5440 µm x 3072 µm
- **die dimensions:**
  - **COB:** 6600 µm x 5800 µm

Functional Block Diagram
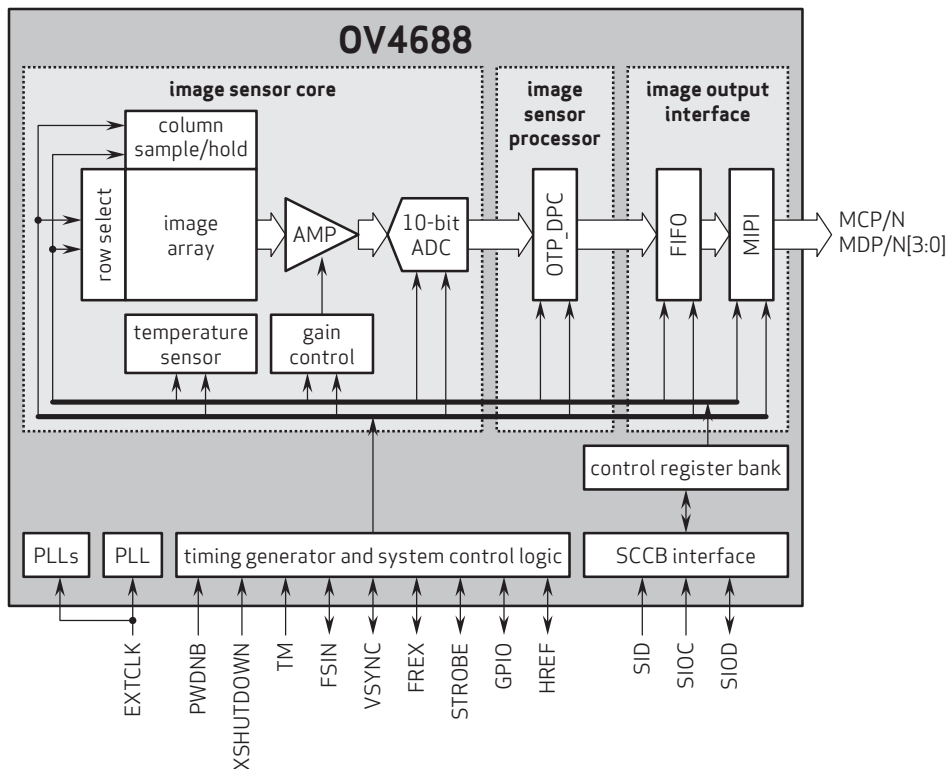
OmniVision.

Micro Gimbal Stabilizer (MGS) OIS Camera Modules

Micro Gimbal Stabilizer (MGS) is the patented mechanical optical image stabilizer (OIS) for camera modules. The MGS technology is tilting the image sensor and lens together, enabling anti-shaking performance for moving devices to take a sharp and clear image, even in the low light environment.
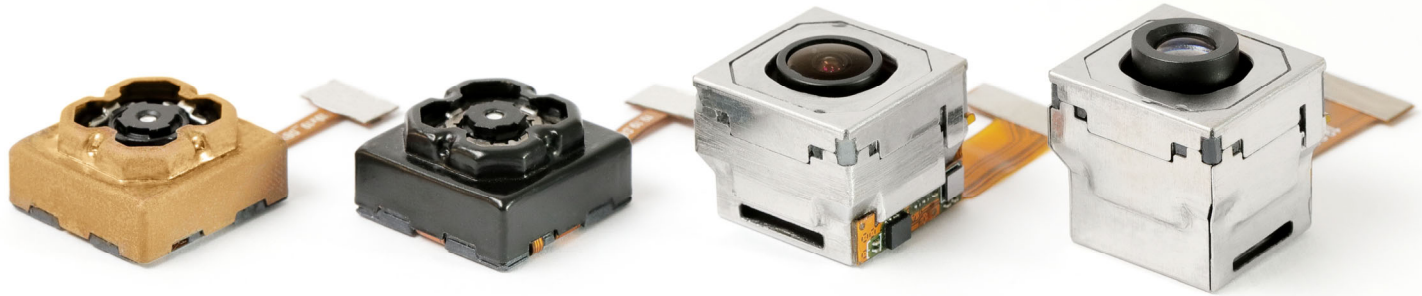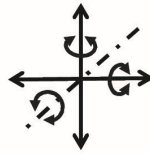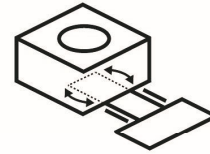
Features
2-Axis Compensation
Small, Light Weight
18.80x18.80x15.80mm

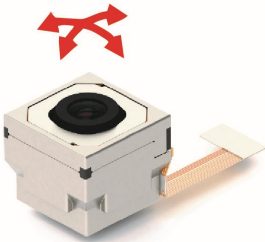Smallest Gimbal

Multi-Axis Compensation

Embedded Moving FPC
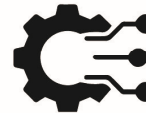
One-stop Solution

±3°
Stabilizer

160°
Max. View Angle

Integrated Design

+45
Patents

Applications

5G Smart Helmet

Sport Camera

Drones

Robots

Wearable Cameras

YDS

Micro Gimbal Stabilizer (MGS) for Mobile Phones

Micro Gimbal Stabilizer (MGS) is fitting in the compact size, enabling the smartphones and tablet PC to take clear images in the moving environment.

Y

Roll

Yaw

X

EIS

MGS

EIS

MGS

Object recognition success rate

+200%

90%
60%
30%
0%

EIS   MGS

OIS

MGS

MGS camera significantly reduces blurry in low light environment, and supports dynamic face and object recognition with 2 times faster rate.

www.YDSCAM.com   sales@ydscam.com   Phone (WeChat, QQ): (+86) 177 2732 6718
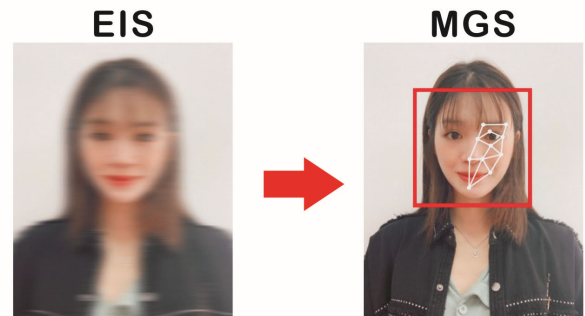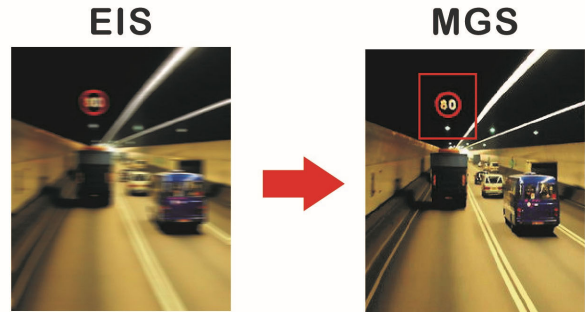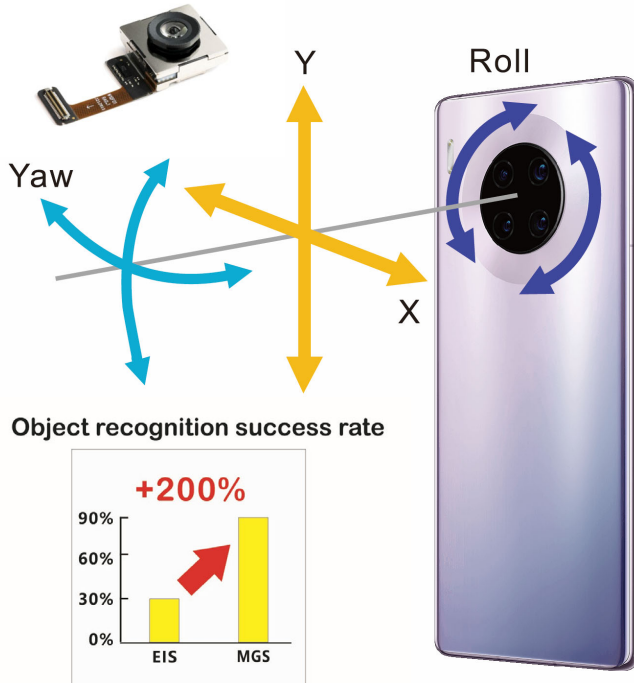
REV.	Q'TY	ECN. NO.	APR.	DATE
A	--	RC-12-2-019	Jason Su	2012.08.07

RoHS Compliant 2002/95/EC
Pb Process Capable
Halogen Compliant Halogen Free

A
B±0.1
0.40±0.05
0.15±0.03
2.20
Ø0.70 NOZZLE PICK AREA

0.77
(0.39)
2.50

0.08
ALL SOLDER PEGS & CONTACT TAILS

BAM04-XX083-XX00
0.80
BAF04-XX083-XX00
MATING SECTION

1.06
2.50
0.30±0.03
C±0.1

+0.00(U.S.L) Housing
-0.04(L.S.L)
SMT Side
STAND OFF
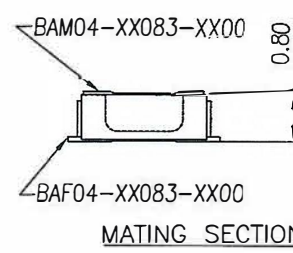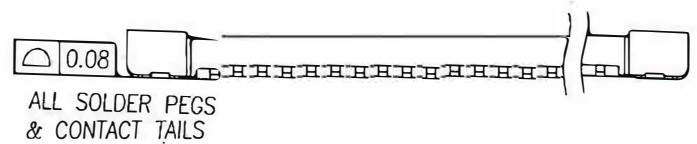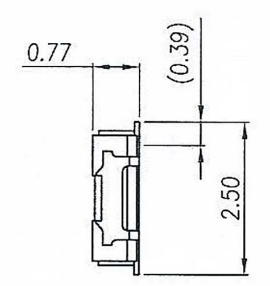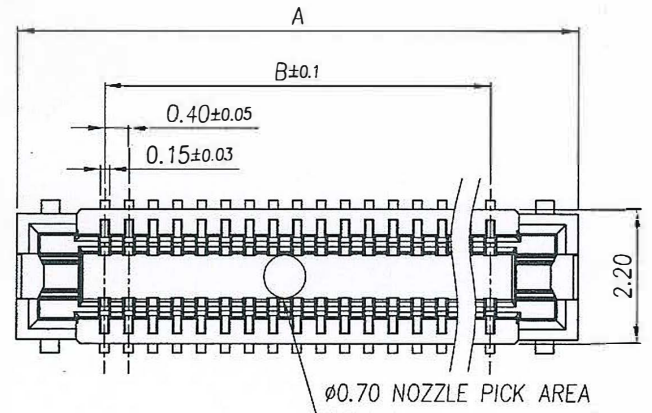
NOTES:
1.) MATERIAL:
  1-1.HOUSING: THERMOPLASTIC,UL94 V-0,BLACK;
  1-2.CONTACT: COPPER ALLOY, T=0.08mm
2.) FINISH:
  2-1.CONTACT: Au 5u" MIN PLATING ON CONTACT AREA,
       Au 1u" MIN. PLATING ON SOLDER TAIL,
       50u" MIN. NICKEL UNDERPLATING OVER ALL
3.) PRODUCT SPECIFICATIONS:
  3-1.VOLTAGE RATING: 60V AC/DC
  3-2.CURRENT RATING: 0.3A/CONTACT(MAX. 5A AT TOTAL CONTACT)
  3-3.INSULATION RESISTANCE: 100MEG.OHM MIN(INITIAL)
  3-4.WITHSTANDING VOLTAGE: 150V AC FOR 1 MINUTE
  3-5.CONTACT RESISTANCE: 70 MILL.OHM MAX PER PIN INITIAL,
       AFTER CONDITION ΔR=20 MILL.OHM Max.
  3-6.OPERATION TEMPERATURE: -55° TO +85°
  3-7.MATING FORCE: 120g Max./POS.
  3-8.UNMATING FORCE: 15g Min./POS.
  3-9.DURABILITY: 30 CYCLES
4.) PART NO:

BAF04-XX083-0500
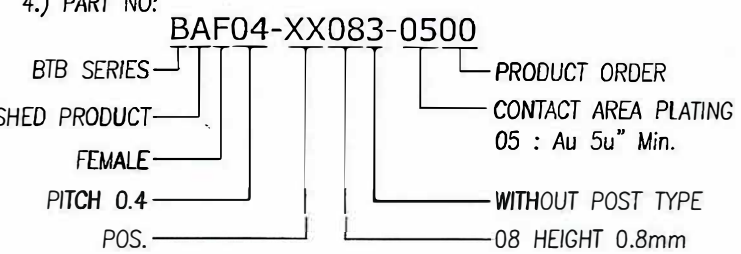BTB SERIES
FINISHED PRODUCT
FEMALE
PITCH 0.4
POS.
PRODUCT ORDER
CONTACT AREA PLATING
05 : Au 5u" Min.
WITHOUT POST TYPE
08 HEIGHT 0.8mm

TABLE:
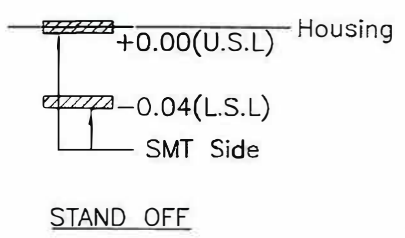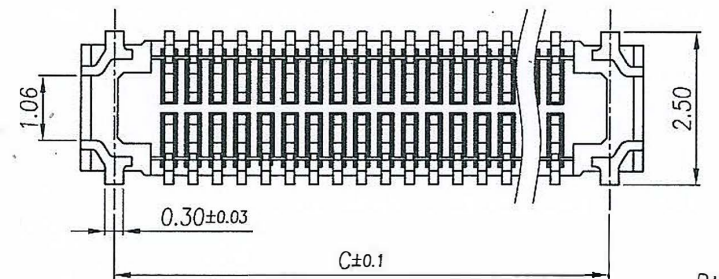
Pos No:	A	B	C	Available
60	14.50	11.60	13.40	
50	12.50	9.60	11.40	
40	10.50	7.60	9.40	
34	9.30	6.40	8.20	
30	8.50	5.60	7.40	◎
26	7.70	4.80	6.60	
24	7.30	4.40	6.20	◎
20	6.50	3.60	5.40	
16	5.70	2.80	4.60	
10	4.50	1.60	3.40	◎

B±0.05
0.40±0.03
0.23±0.03
(0.50)
0.20±0.03
1.06±0.03
(0.92)
2.90±0.03
1.90±0.03
0.90±0.03
1.45±0.03
C0.30
INSULATION AREA
RECOMMENDED PCB LAYOUT
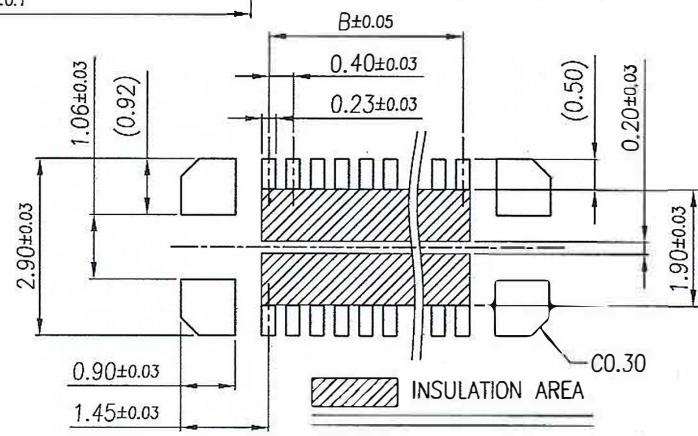
DIMENSION IN mm	
TOLERANCE UNLESS OTHERWISE SPECIFIED	
.X± 0.35	X.°± 5°
.XX± 0.25	.X°± 3°
.XXX± 0.15	.XX°± 1°

APR.
CHK.
DRA. Kevin Wang 2012.08.07

LCN Shenzhen Linkconn Electronics Co.,Ltd.

TITLE: 0.4mm PITCH BTB FEMALE MATING HEIGHT 0.8mm
DWG NO. BAF04-24083-0500
PROJ.
CUSTOMER DRAWING
SIZE A4 | SCALE N/A | SHEET 1/2 | REV. A
F-RD-18A

RoHS Compliant 2002/95/EC

Pb Process Capable

HALOGEN Compliant Halogen Free

Trailer (160mm Minimum)
20 Empty Carrier Tape

LEADER(100mm Minimum)
13 Empty Carrier Tape

COVER TAPE
(300mm Minimum)

See Detail A

ADHESIVE TAPE

COVER TAPE

⟵ PACKAGING DIRECTION   USER DIRECTION OF UNREELING ⟹

Plastic Reel

ø13

ø330

ø100

COVER TAPE PEELING ANGLE:165°~180°
PEELING FORCE:20~130g   CARRIER TAPE

2.0±0.1   4.0±0.1   ø1.50+0.10/-0.00

B

1.75±0.1   A

8.0±0.1

DETAIL A

⟵ PACKAGING DIRECTION   USER DIRECTION OF UNREELING ⟹

POS NO	DIM A	DIM B	QTY/REEL	REEL/CARTON	QTY/CARTON	CARTON SIZE
60						
50						
40	24.00	11.50	3000	10	30000	340*340*330
30						
26						
24						
20	16.00	7.50	3000	14	42000	340*340*330
16						
10						

Cameras Applications
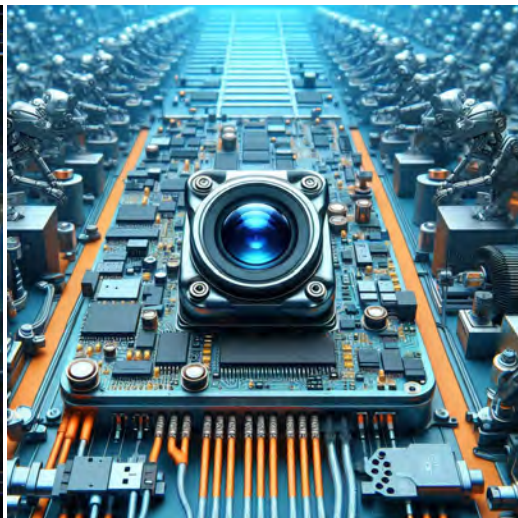

Automotive Driver Pilot

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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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

YDS CAMERA MODULE

Camera Inspection Standard

Inspection Item		Inspection Method	Standard of Inspection
Category	Item		
Appearance	FPC/ PCB — Color	The Naked Eye	Major Difference is Not Allowed.
	FPC/ PCB — Be Torn/Chopped	The Naked Eye	Copper Crack Exposure is Not Allowed.
	FPC/ PCB — Marking	The Naked Eye	Clear, Recognizable (Within 30cm Distance)
	Holder — Scratches	The Naked Eye	The Inside Crack Exposure is Not Allowed
	Holder — Gap	The Naked Eye	Meet the Height Standard
	Holder — Screw	The Naked Eye	Make Sure Screws Are Presented (If Any)
	Holder — Damage	The Naked Eye	The Inside Crack Exposure is Not Allowed
	Lens — Scratch	The Naked Eye	No Effect On Resolution Standard
	Lens — Contamination	The Naked Eye	No Effect On Resolution Standard
	Lens — Oil Film	The Naked Eye	No Effect On Resolution Standard
	Lens — Cover Tape	The Naked Eye	No Issue On Appearance.
Function	Image — No Communication	Test Board	Not Allowed
	Image — Bright Pixel	Black Board	Not Allowed In the Image Center
	Image — Dark Pixel	White board	Not Allowed In the Image Center
	Image — Blurry	The Naked Eye	Not Allowed
	Image — No Image	The Naked Eye	Not Allowed
	Image — Vertical Line	The Naked Eye	Not Allowed
	Image — Horizontal Line	The Naked Eye	Not Allowed
	Image — Light Leakage	The Naked Eye	Not Allowed
	Image — Blinking Image	The Naked Eye	Not Allowed
	Image — Bruise	Inspection Jig	Not Allowed
	Image — Resolution	Chart	Follows Outgoing Inspection Chart Standard
	Image — Color	The Naked Eye	No Issue
	Image — Noise	The Naked Eye	Not Allowed
	Image — Corner Dark	The Naked Eye	Less Than 100px By 100px
	Image — 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

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your best camera partner

YDSCAM Package Solutions

YDS Camera Module

Complete with Lens Protection Film
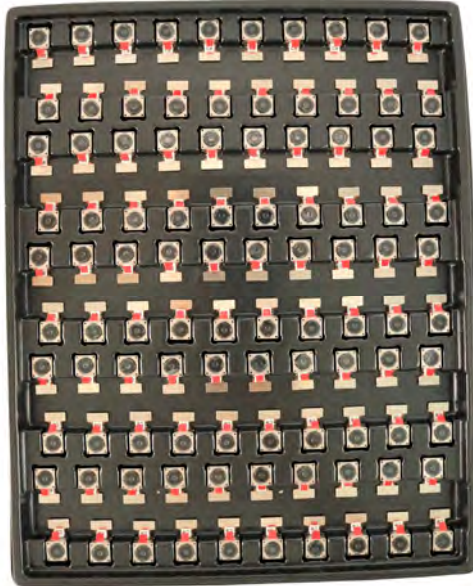
C8

Tray with Grid and Space

Place Cameras on the Tray

YDSCAM Package Solutions

Full Tray of Cameras

Cover Tray with Lid

Place Tray into Anti-Static Bag

Vacuum the Anti-Static Bag

YDSCAM Package Solutions

Sealed Vacuum Anti-Static Bag with Labels

1. Model and Description   2. Quantity   3. Manufacturing Date Code   4. Caution

Label 1:

YDS Model No.
YDS-MAA12-IMX586 V1.0
IMX586, MIPI Interface
Auto Focus, 79.4 Degree
www.ydscam.com MADE IN CHINA

Label 2:

Tray 1 of 1
100 PIECES
Production Date
20 August 2022
Date Code
2234 (Week 34, 2022)
www.ydscam.com MADE IN CHINA

CAUTION
STATIC SENSITIVE DEVICES
NOT TO BE HANDLED BY UNAUTHORISED PERSONNEL

YDSCAM Package Solutions

Place Foam Sheets Between Tray Bags

Foam Sheets are Larger Than Trays

Place Foam Sheets and Trays into Box

Foam Sheets are Tightly Fitting in Box

Seal the Carbon Box

Label the Carbon Shipping Box

YDSCAM Package Solutions

USB Camera Module

Complete with Lens Protection Film

Place Camera Sample into Anti-Static Bag

Place USB Cameras into Tray

Seal the Tray with Anti-Static Bag

Label the Carbon Shipping Box

www.YDSCAM.com   sales@ydscam.com   Phone (WeChat, QQ): (+86) 177 2732 6718

your best camera partner

YDSCAM Package Solutions

Place Camera Sample into Anti-Static Bag

Place Connectors into Anti-Static Bag

Label the Sample Bags

Place Connectors into Reel

Place Samples into the Carbon Box

Place Connectors into the Carbon Box

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Company YDSCAM

YingDeShun Co. Ltd. (YDS) was established in 2017, a next-generation technology driven manufacturer specialized in research, design, and produce of audio and video products. YDS is occupying 20,000 square feet automated plants with 100 employees of annual throughput 30,000,000 units cameras.

YDS 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. YDS 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
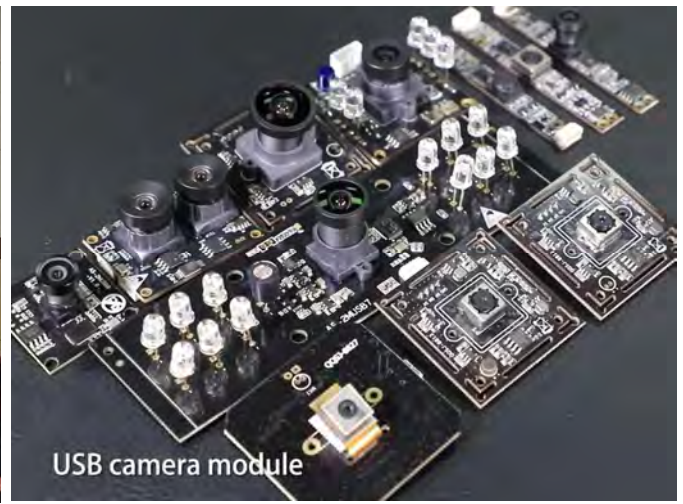
Limited Warranty

YDS provides the following limited warranty if you purchased the Product(s) directly from YDS company or from YDS's website www.YDSCAM.com. Product(s) purchased from other sellers or sources are not covered by this Limited Warranty. YDS 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, YDS 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 YDS is solely limited to repair and/or replacement on the terms set forth above. YDS is not reliable or responsible for any subsequential events.

YDS Strength

Powerful Factory

Professional Service

Promised Delivery