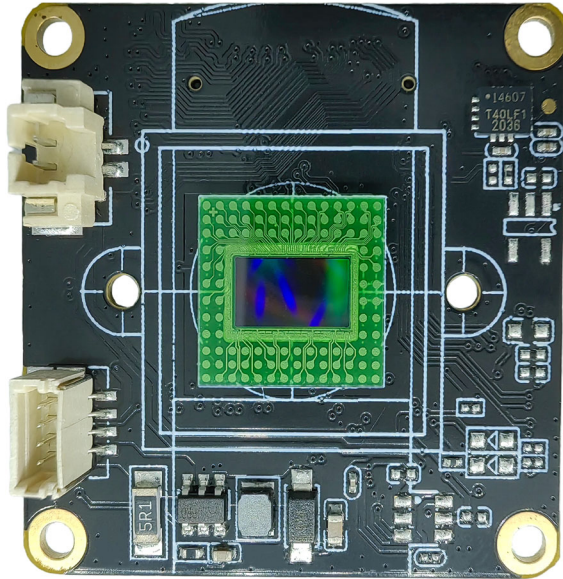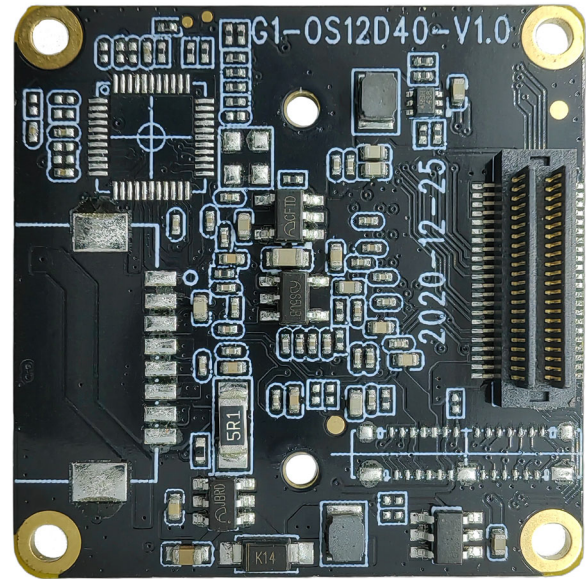## YDS-CMNL-OS12D40 V1.0
11.3MP OmniVision OS12D40 No Lens Camera Module

Front View

Back View

Overview

The OmniVision OS12D40 color image sensor used in the YDS-CMNL-OS12D40 V1.0 camera module No Lens sensor board is a high-performance CMOS 1/2.49" image sensor that can provide 11.3 megapixels (4512x2512) image signals at up to 60FPS, with a pixel size of 1.404um x 1.404um. Users can freely match lenses.

When used with the master board, it can support shooting 11MP high-definition images, up to 4K@60FPS (differential), and 4K@30FPS video shooting. This camera uses board-to-board socket connection.

It supports multi-axis EIS anti-shake image stabilization function. The board frame size is 32*32mm.

YDS-CMNL-OS12D40 V1.0
11.3MP OmniVision OS12D40 No Lens Camera Module

Specifications

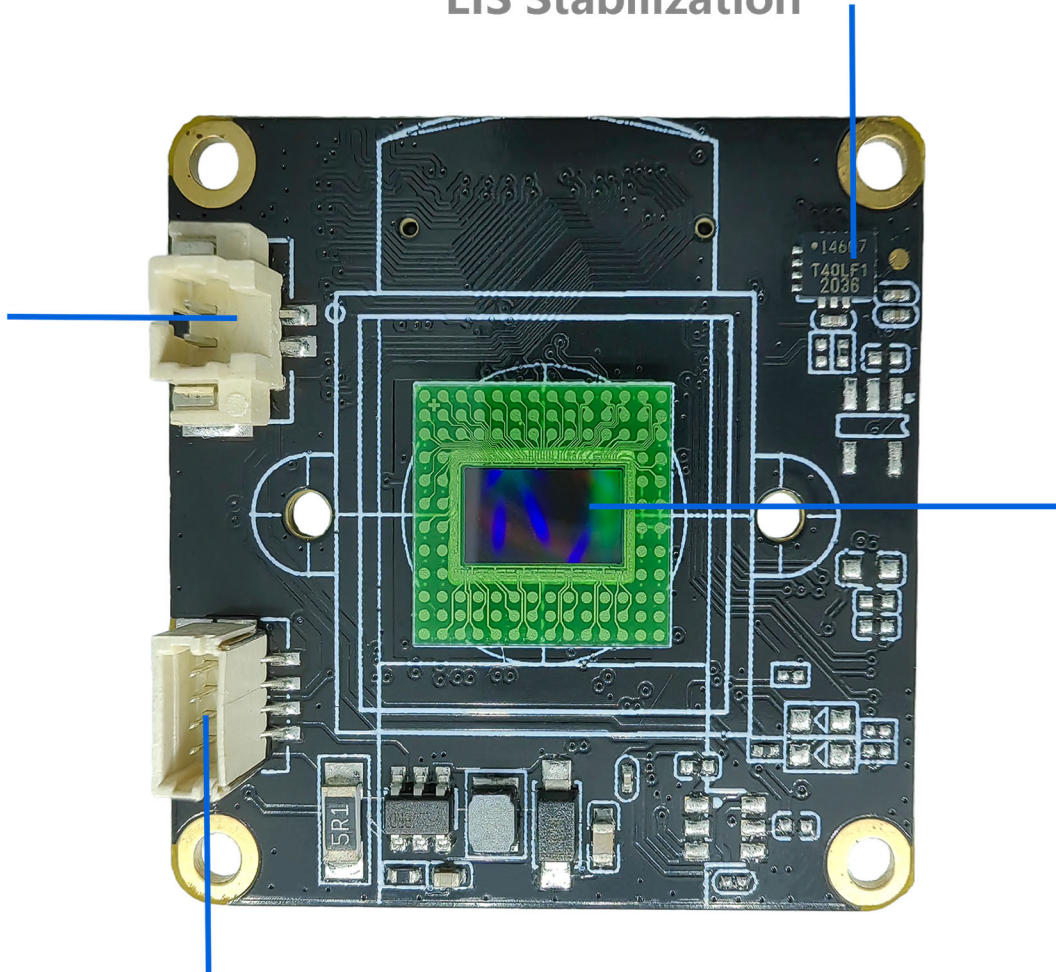| Model No.	YDS-CMNL-OS12D40 V1.0
Image Sensor	OS12D40
Image Sensor Type	CMOS
Effective Pixels	11.3 Megapixels
Sensor Size	1/2.49"
Pixel Size	1.404 um x 1.404 um
EIS Anti-Shake (Reserved)	Supportive Electronic EIS Image Stabilization
Video Frame Rate	4K@24/25/30/FPS, 4K@48/50/60FPS (Differential) 2.7K@24/25/30/48/50/60FPS 1080P@24/25/30/48/50/60/120FPS 720P@24/25/30/48/50/60/120/240FPS
Video Format	H.264
Video Output Format	MOV (Can be Modified as MP4)
Video Slow Motion	OFF, 4K2X, 1080P4X, 720P8X
Photo Format	JPG
Photo Resolution (with Master Board)	20MP (5200x3900) (Differential) 13MP (4160x3120) (Differential) 12MP (4000x3000) 10MP (3648x2736) 8MP (3264x2448) 5MP (2592x1944) 3MP (2048x1536) 2MP (1920x1080)
Operating Temperature	-10°C to +60°C
Storage Temperature	-20°C to +80°C
Humidity	20% to 80%
PCB Dimensions	32 x 32 mm
PCB Screw Hole Spacing	28 x 28 mm
PCB Screw Hole Diameter	2 mm
Lens Mount Screw Diameter	1.6 mm

YDS-CMNL-OS12D40 V1.0
11.3MP OmniVision OS12D40 No Lens Camera Module

陀螺仪，支持EIS防抖
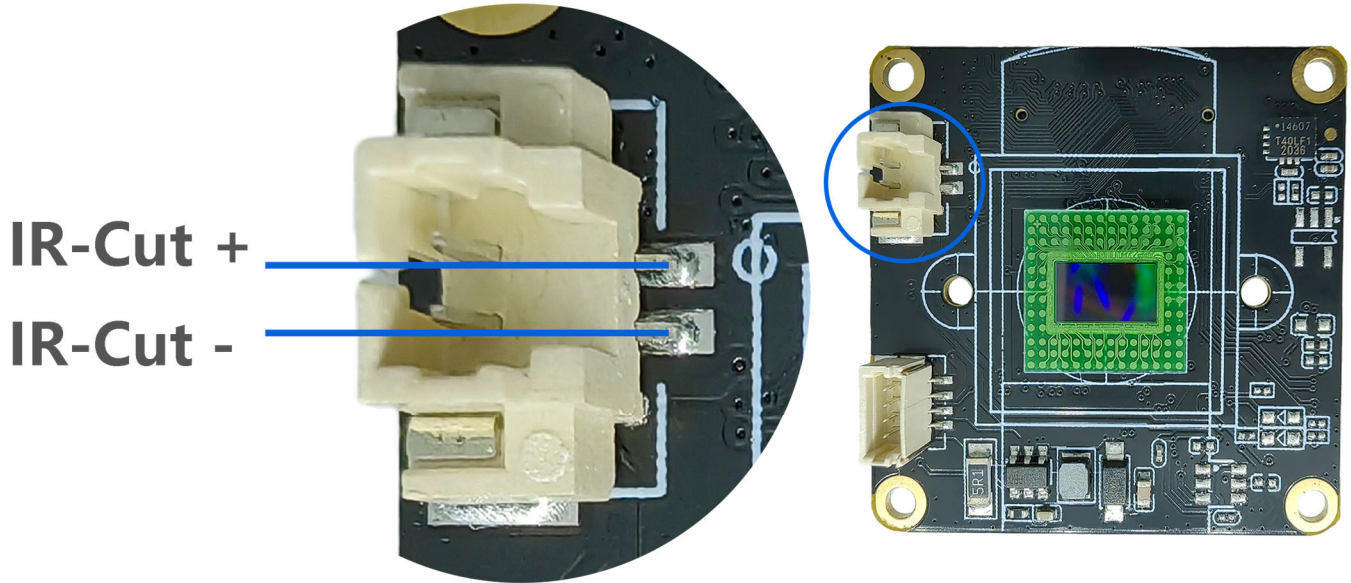
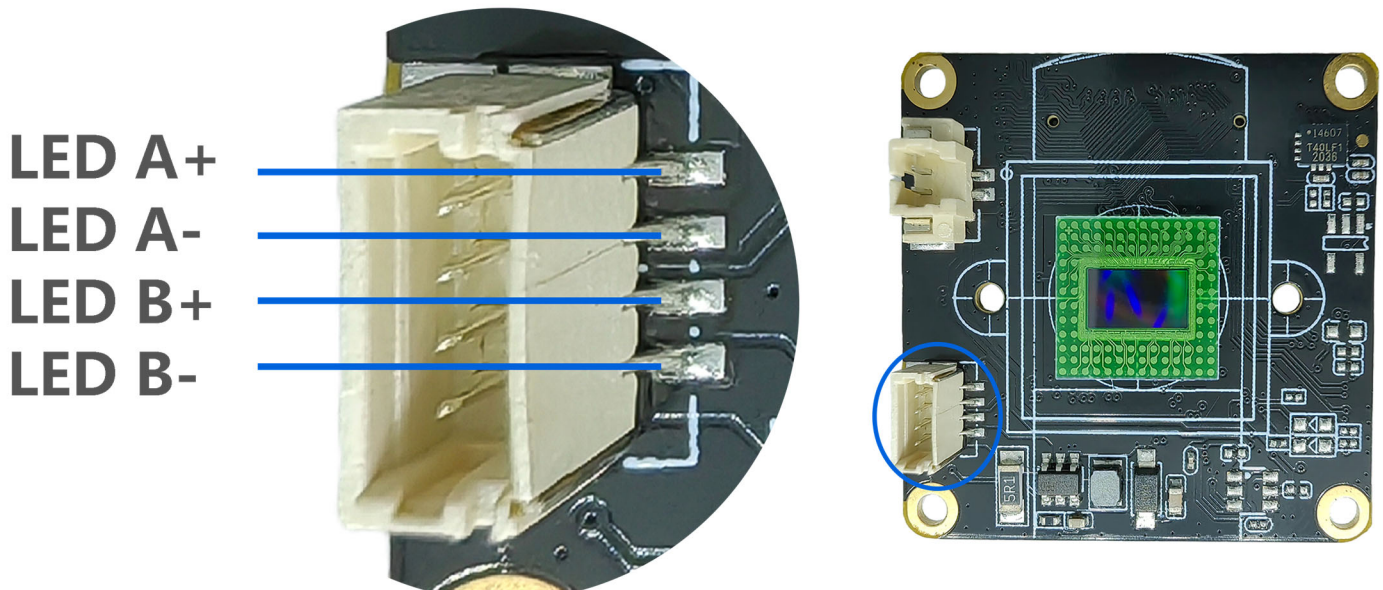EIS Stabilization

滤光片切换器接口

IR-CUT INTERFACE

OV OS12D40 sensor

两组LED补光灯接口

LEDS * 2 INTERFACE

YDS-CMNL-OS12D40 V1.0
11.3MP OmniVision OS12D40 No Lens Camera Module

IR-Cut +

IR-Cut -

The IR-Cut filter switch interface is used by lenses with filters. Users need to match the lens that supports the IR-Cut switch structure in order to support this function.

LED A+
LED A-
LED B+
LED B-

The two sets of fill light interfaces support the expansion of infrared light and white light boards to provide fill light for the device. If you need the fill light function, you need to add the YDS-LEDP V2.0 White and Infrared Light LED Plate.

YDS-CMNL-OS12D40 V1.0
11.3MP OmniVision OS12D40 No Lens Camera Module

通过板对板连接器连接G1主板
支持Sensor、EIS、IR-CUT、LED等
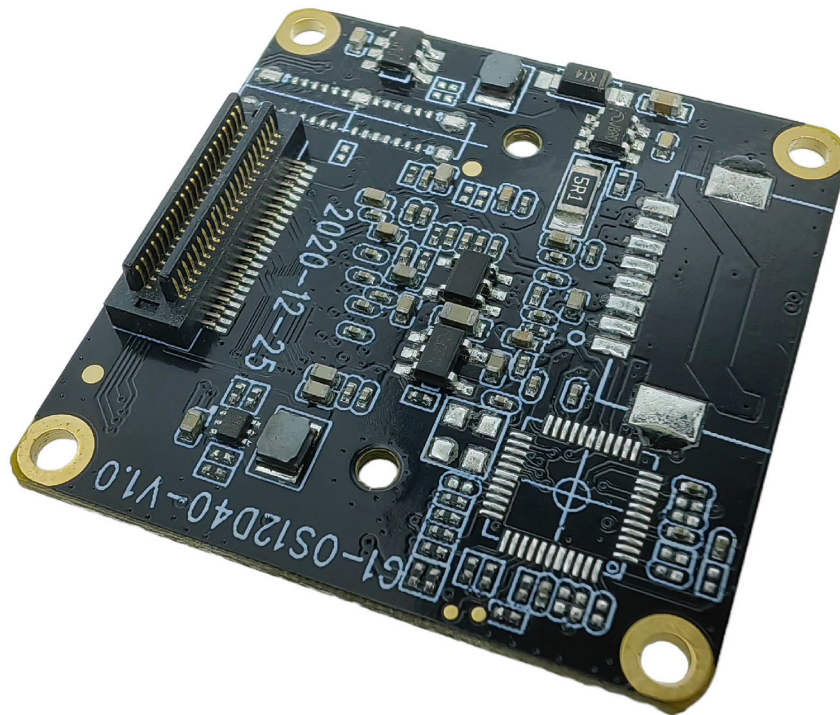## Connect Sensor、EIS、IR-CUT、LED etc.
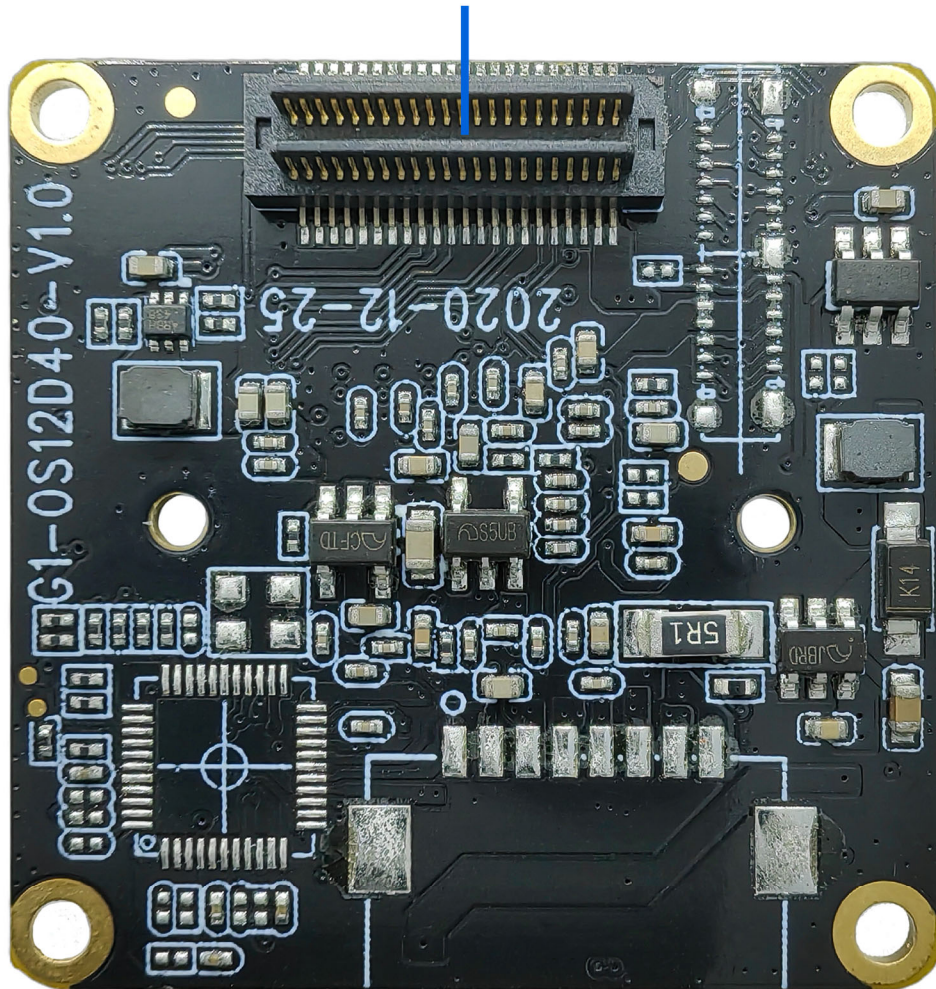
YDS-CMNL-OS12D40 V1.0
11.3MP OmniVision OS12D40 No Lens Camera Module
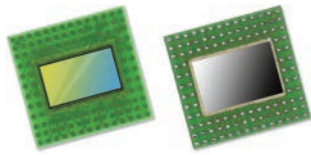
OS12D40 11.3-megapixel product brief

Security Image Sensor Provides Industry-High 11.3MP Resolution for 4K2K With Electronic Image Stabilization and Best in Class HDR for 1080p Video

available in a lead-free package

OmniVision's OS12D40 is a 1.4 micron pixel, 11.3MP image sensor that offers the unprecedented combination of a large 1/2.49" optical format, on-chip remosaic (4-cell to Bayer) color converter and on-chip high dynamic range (HDR) processing. It is the industry's only security sensor with 3-exposure, 4-cell HDR capability to provide larger-pixel low light performance with the best artifact elimination for moving objects. When in full-HD 1080p mode, this sensor's 3-exposure HDR with on-chip combination and tone mapping provides best in class video captures. This is superior to the competing method, known as staggered HDR, which relies on additional passes that introduce motion artifacts, especially in low light.

Integrated selective conversion gain technology allows the pixel conversion gain to be dynamically switched between low and high, depending on the scene being captured. In combination with its other features—including PureCel®Plus-S stacked pixel technology for reduced cross talk and maximum quantum efficiency in low light—this image sensor enables mass market security cameras to capture the industry's highest quality video and ultra wide angle photos.

The OS12D40's fast mode switch allows security operators or AI-enabled surveillance systems to seamlessly switch to 4K2K mode when a specific threat is identified for closer inspection, such as a potential intruder or unauthorized vehicle. This sensor's best in class 11.3MP resolution provides the extra pixels needed for 4K2K images with electronic image stabilization (EIS), to ensure that details can be clearly identified.

The OS12D40 is a native 16:9 aspect ratio image sensor that uses a 4-cell color filter pattern. It has an on-chip 4-cell to Bayer remosaic converter, in order to provide 4K video at 60 fps with 20% additional pixels for EIS. In a 4-cell binned mode, it can output an impressive 2.8MP/1080p resolution with 20% additional pixels for EIS video and images at four times the sensitivity. This sensor also supports both CPHY and DPHY interfaces.

Find out more at www.ovt.com.

Applications

- Security Cameras
- Machine Vision
- PC Multimedia

OS12D40

Ordering Information

- **OS12D40-J08A-Z** (color, lead-free)
  108-pin fan-out package

Product Features

- automatic black level calibration (ABLC)
- programmable controls for:
  - frame rate
  - mirror and flip
  - binning
  - cropping
  - windowing
- support for dynamic defect pixel cancellation (DPC)
- supports output formats: 10-bit RGB 4-cell pattern Bayer RAW
- supports horizontal and vertical subsampling
- supports typical images sizes:
  - 4512 x 2512
  - 3840 x 2160
  - 2256 x 1256
  - 1920 x 1080
  - 1280 x 720
- standard serial SCCB interface

- up to 4-lane MIPI TX interface with speed up to 2.5 Gbps/lane
- embedded 8k bits of one-time programmable (OTP) memory (4k bits reserved for customer use)
- 2/3 trio C-PHY interface, up to 1.6 Gsps/trio
- 4-cell support:
  - 4-cell binning
  - 4-cell full
- on-chip 4-cell to Bayer converter
- three on-chip phase lock loops (PLLs)
- sequential multi-frame HDR
- 2.8MP 10-bit 3-exposure 4C HDR output after tone mapping
- programmable I/O drive capability
- built-in temperature sensor
- typical module size: 8.5 x 8.5 x -5.1 mm

Technical Specifications

- **active array size:** 4512 x 2512
- **maximum image transfer rate:**
  - **4512 x 2512:** 60 fps
- **power supply:**
  - **core:** 1.1V
  - **analog:** 2.8V
  - **I/O:** 1.8V
- **power requirements:**
  - **active:** 505 mW
  - **standby:** <10 µW
- **temperature range:**
  - **operating:** -30°C to +85°C junction temperature
  - **stable:** 0°C to +60°C junction temperature

- **output formats:**
  - 10-bit RGB 4-cell pattern Bayer RAW
- **lens size:** 1/2.49"
- **lens chief ray angle:** 8.7° linear
- **scan mode:** progressive
- **pixel size:** 1.404 µm x 1.404 µm
- **image area:** 6365.736 µm x 3554.928 µm

Functional Block Diagram
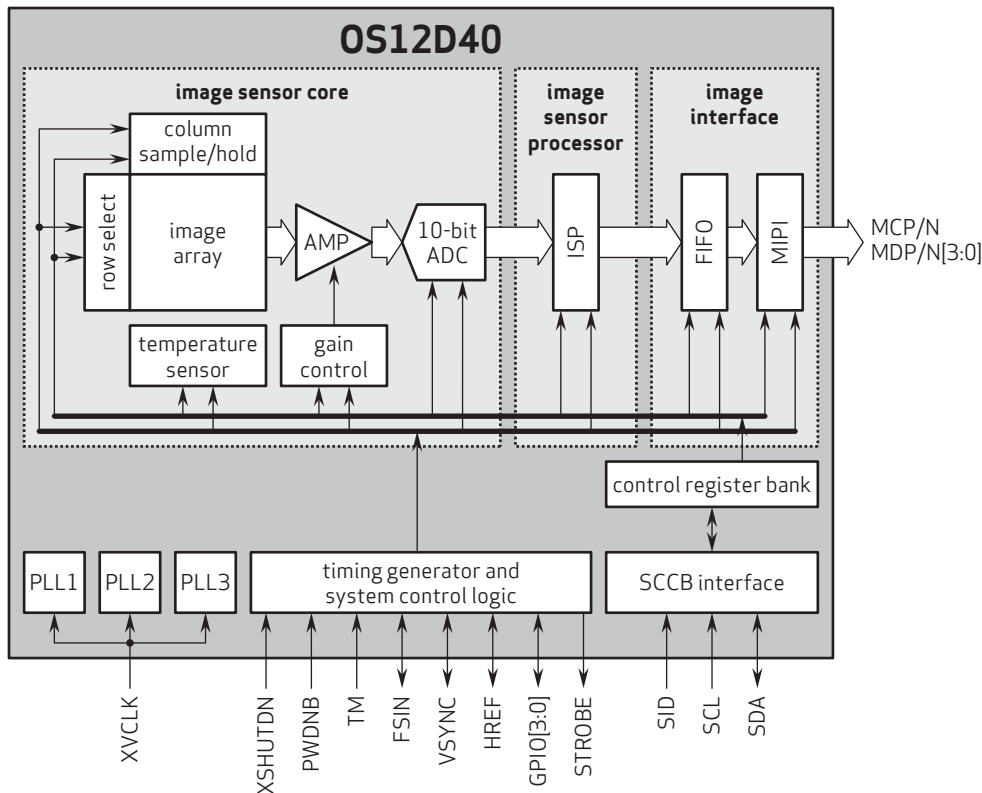
Version 1.1, August 2020

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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
	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

YDS CAMERA MODULE

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Camera Inspection Standard

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

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YDSCAM Package Solutions

YDS Camera Module

Complete with Lens Protection Film

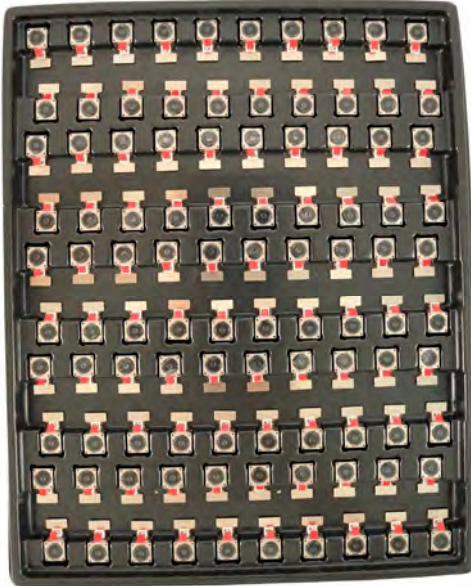

Tray with Grid and Space

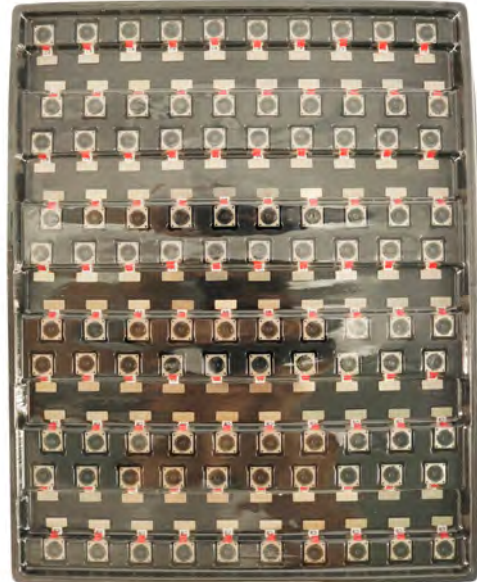Place Cameras on the Tray

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

YDS CAMERA

YDS Model No.

YDS-MAA12-IMX586 V1.0

IMX586, MIPI Interface

Auto Focus, 79.4 Degree

www.ydscam.com MADE IN CHINA

YDS CAMERA

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

YDSCAM Package Solutions

Place Camera Sample into Anti-Static Bag

Place Connectors into Anti-Static Bag

Label the Sample Bags

YDS Model No.

YDS-MAA12-IMX586 V1.0

IMX586, MIPI Interface

Auto Focus, 79.4 Degree

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CAUTION
STATIC SENSITIVE DEVICES
NOT TO BE HANDLED BY UNAUTHORISED PERSONNEL

OK-10F030-04

Mating Connector for

YDS-MAA12-IMX586 V1.0

10 PIECES

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Place Connectors into Reel

Place Samples into the Carbon Box

Package: 1 of 1

fragile HANDLE WITH CARE

Place Connectors into the Carbon Box

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 CAMERA MODULE

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YDS Strength

Powerful Factory

Professional Service

Promised Delivery