YDS-USB-0318 V1
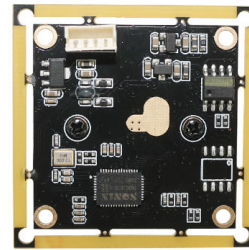## 2.13MP 0318 Sony IMX291 M12 Fixed Focus USB 2.0 Camera Module

YDS-USB-0318 V1 is a 2.13MP Fixed Focus USB camera module based on 1/2.8" IMX291 image sensor. It delivers high-speed, 1080P resolution ultra sharp image. The S-mount (M12) lens holder enables customers to choose different lens as per varies applications. This camera module is ideal solution for face recognition, identity detection, automotive, access control.

Key Features

> 2K resolution (1920 x 1080) Sony IMX291 sensor
> High speed USB 2.0 Plug and Play
> MJPG and YUV2 output format
> Low power consumption
> Compact size
> UVC compliant to Windows, Linux, OS with UVC driver
> USB OTG (On-The-Go) support

YDS-USB-0318 V1
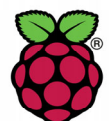
2.13MP 0318 Sony IMX291 M12 Fixed Focus USB 2.0 Camera Module

Camera Module No.	YDS-USB-0318 V1
Resolution	2.13MP
Image Sensor	IMX291
Sensor Type	1/2.8"
Pixel Size	2.9 um x 2.9 um
EFL	3.60 mm
F.NO	3.00
Pixel	1920 x 1080
View Angle	96.0°(DFOV) 80.0°(HFOV) 65.0°(VFOV)
Lens Dimensions	14.00 x 14.00 x 20.60 mm
Module Type	Fixed Focus
Interface	USB 2.0
Output Format	MJPG / YUV2
Auto Control	Saturation, Contrast, Acutance White Balance, Exposure
Audio	Optional
Input Voltage	DC 5V
Working Current	Max 500mA
PCB Size	38.00 x 38.00 mm / 32.00 x 32.00 mm
System Compatibility	Windows XP (SP2, SP3), Vista, 7, 8, 10, 11 Android, Mac OS, Linux or OS with UVC Driver Raspberry Pi by USB Port
Software for USB Camera	AMCAP, Webcam Viewer, V4L2 Controls Contacam, VLC Player, MotionEye OS iSpy, ZoneMider, Yawcam
Lens Type	650nm IR Cut
Operating Temperature	-30°C to +85°C
USB Cable	USB Cable

Wide Compatibility with Windows, Android, Mac OS, Linux, or Raspberry Pi

YDS-USB-0318 V1
2.13MP 0318 Sony IMX291 M12 Fixed Focus USB 2.0 Camera Module

Top View

Side View

Bottom View

USB Cable

YDS-USB-0318 V1
2.13MP 0318 Sony IMX291 M12 Fixed Focus USB 2.0 Camera Module

FORMAT	RESOLUTION	FRAME RATE
		USB 2.0
MJPG	640 x 480 (VGA)	30 FPS
MJPG	1280 x 720 (720P)	30 FPS
MJPG	1920 x 1080 (1080P)	30 FPS
YUV2	640 x 480 (VGA)	30 FPS
YUV2	1280 x 720 (720P)	10 FPS
YUV2	1920 x 1080 (1080P)	5 FPS
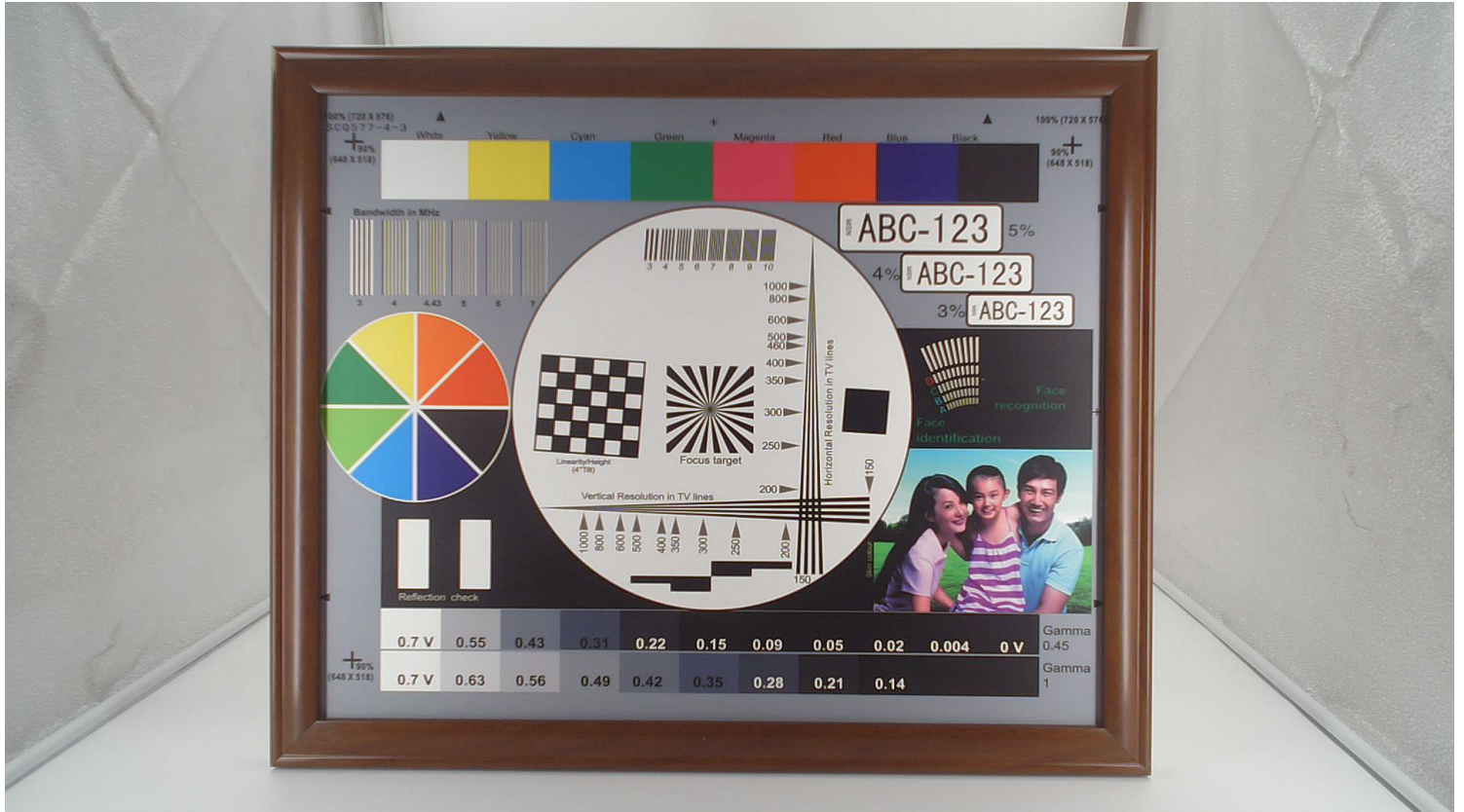
EIA RESOLUTION   CHART 1956
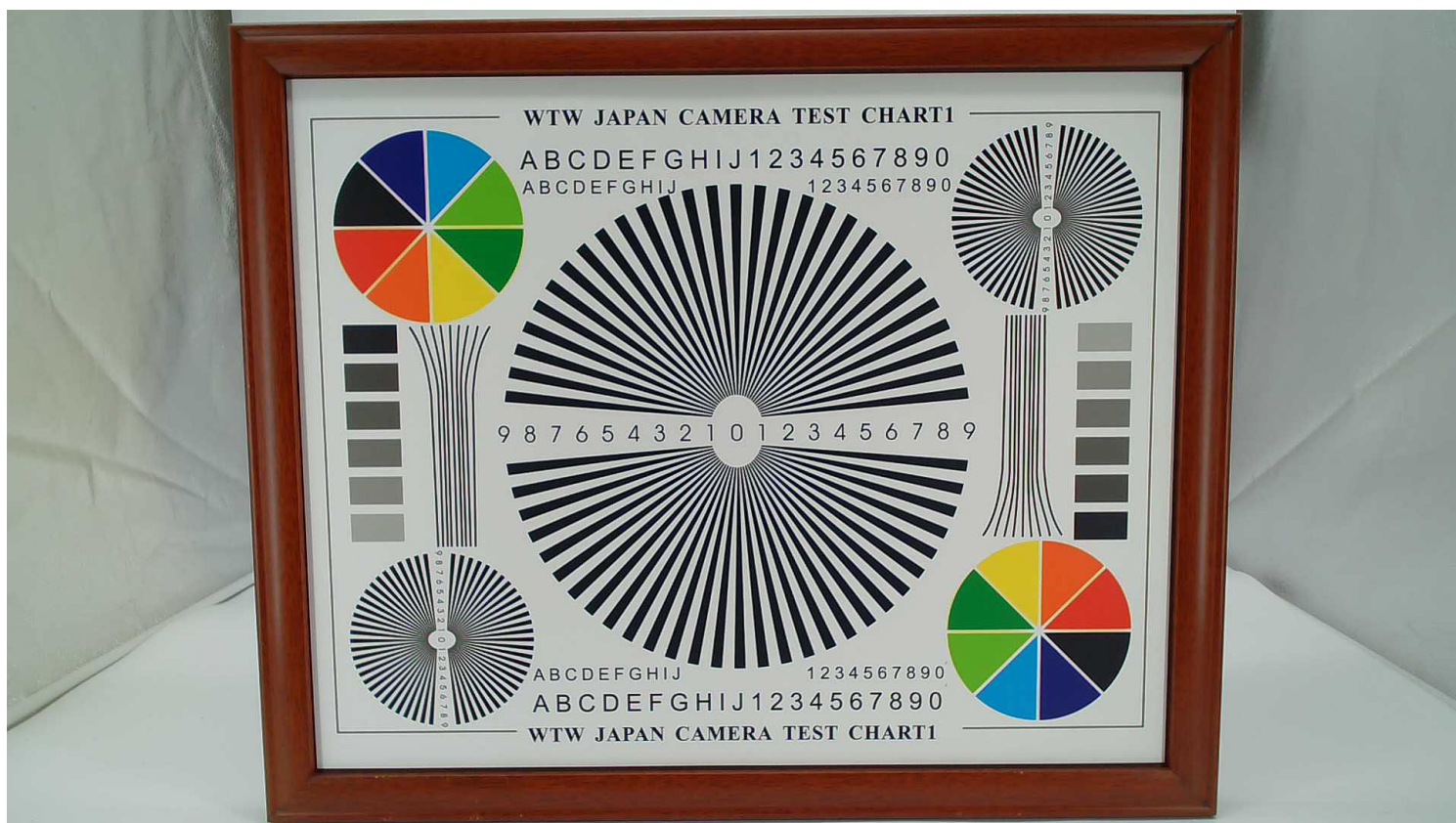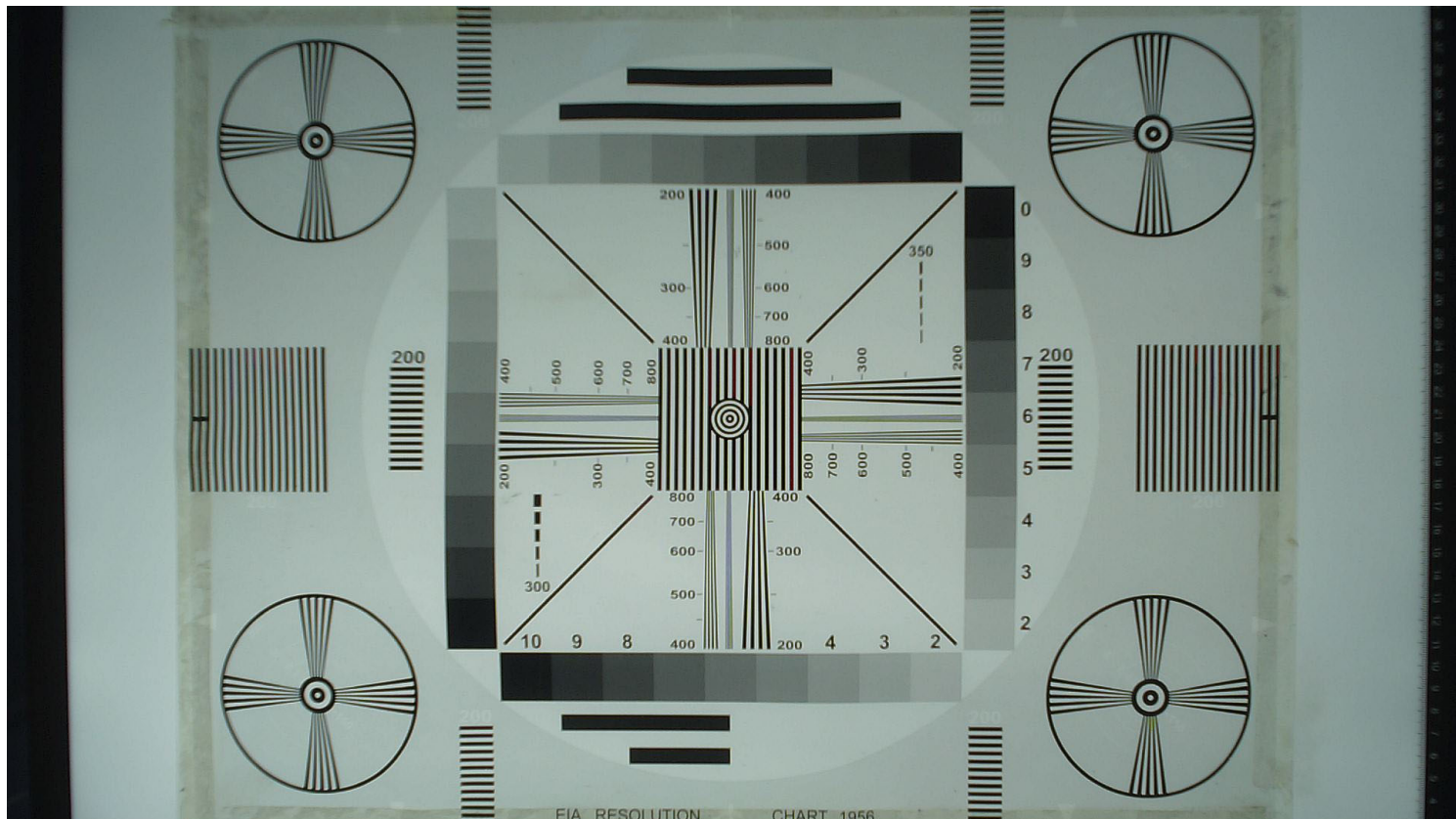
Version	Information
V1.0	First Version

1945
1109

TOP VIEW

38.00±0.20
34
28.00
Ø14.00
28.00
34
38.00±0.20

SIDE VIEW

1.20
20.60±0.30
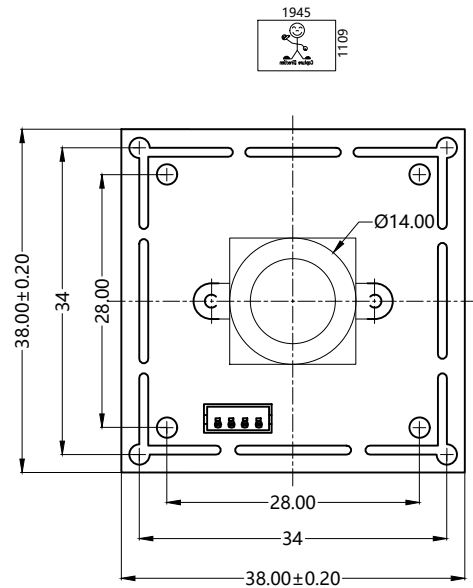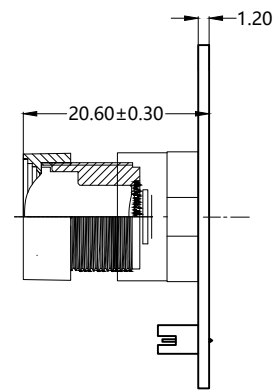
PH1.5,top entry type, 4 PINS

	DGND	DP	DM	USB5V
	P4	P3	P2	P1

BOTTOM VIEW

8xφ2.4
18.00
φ2x1.8
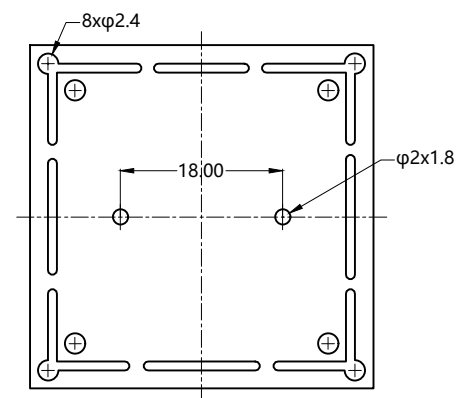
Parameter：
1、Sensor specification：
Image Sensor：IMX291
Pixel：2.9um*2.9um
Lens Type：1/2.8
Important Voltage Description：

2、Lens specification：
FOV：96°(D);80°(H);65°(V)
F/NO.：3.0%
Optical distortion：<0.35%
Focal length：3.6mm
Composition：2G2P+IR FILTER
IR Cut Coating：650nm±10nm@50%

Designed By	Kevin	Model Name:	USB-0318 V1
Checked By	Jacky	Projection Type: Third Angle	Unit: mm / Date: 6/25/2024

Scale: 1:1 Sheet: 1 of 1 Version: 1/0

SONY

IMX290LQR, IMX291LQR

Diagonal 6.46 mm (Type 1/2.8) Square Pixel Array
Color CMOS Image Sensor

Back-Illuminated CMOS image Sensors with Improved Visible Light and Near Infrared Sensitivity that Support 1080p

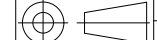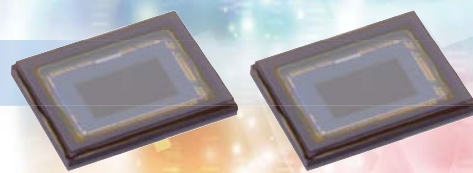Sony has developed the approx. 2.13M effective pixel back-illuminated CMOS image sensors IMX290LQR and IMX291LQR with improved sensitivity in the visible-light and near infrared light regions for industrial applications.

A new 2.9 µm-square unit pixel has been developed that combines a back-illuminated structure with technology for improving near infrared sensitivity to further enhance picture quality at low illumination while at the same time realizing Full HD cameras for industrial applications. This realizes two or more times the sensitivity in the visible-light region and three or more times the sensitivity in the near infrared light region than that of the existing Sony product (IMX236LQJ)*[1]. In addition, two types of WDR (Wide Dynamic Range) technology are also provided to further improve imaging performance.

The new lineup includes the two types of the IMX290LQR, which has the DOL (Digital Overlap) -WDR function and the IMX291LQR, which does not have the DOL-WDR function.

*1 See the New Product Information released in September 2013.

- Back-illuminated structure with 2.9 µm-square unit pixel
- High sensitivity characteristics (two or more times that of the existing product)
- Improved sensitivity in the near infrared light region (three or more times that of the existing product)
- Supports WDR (multiple exposure WDR, DOL-WDR)
- Versatile interface (CMOS parallel, low-voltage LVDS serial, MIPI CSI-2)

Exmor R

* Exmor R is a trademark of Sony Corporation. The Exmor R is a Sony's CMOS image sensor with significantly enhanced imaging characteristics including sensitivity and low noise by changing fundamental structure of ExmorTM pixel adopted column parallel A/D converter to back-illuminated type.

STARVIS

*STARVIS is a trademark of Sony Corporation. The STARVIS is back-illuminated pixel technology used in CMOS image sensors for surveillance camera applications. It features a sensitivity of 2000 mV or more per 1 µm² (color product, when imaging with a 706 cd/m2 light source, F5.6 in 1 s accumulation equivalent), and realizes high picture quality in the visible-light and near infrared light regions.

Back-Illuminated Structure + Improved Sensitivity in the Near Infrared Light Region

Good sensitivity characteristics at low illumination and in the near infrared light region are a required performance of cameras for industrial applications. These new image sensors use a back-illuminated structure and also have an expanded photodiode area, which simultaneously improve sensitivity in both light regions compared to the existing front-illuminated structure.

In addition, the new image sensors realize improved sensitivity characteristics two or more times in the visible-light region and three or more times in the near infrared light region (850 nm) compared to the existing Sony product (IMX236LQJ) with the same pixel size and increased sensitivity in the near infrared light region (Photograph 2).

WDR Function

The IMX290LQR supports both multiple exposure and DOL-type WDR functions. (The IMX291LQR supports only the multiple exposure-type WDR function.)

The multiple exposure-type WDR function outputs one set of two or four frames with different exposure times. In this case, the gain can also be set separately for each frame in addition to the exposure time.

The DOL-type WDR function outputs the data for up to three frames with different storage times line by line. By performing special signal processing with an ISP (Image Signal Processor) or other device at the image sensor rear-end, this enables improvement of picture quality under low illumination compared to the multiple exposure-type WDR function.

Versatile interface

The IMX290LQR and IMX291LQR are equipped with three different types of output interface (low-voltage LVDS serial, MIPI CSI-2, CMOS parallel) to meet diverse needs. The low-voltage LVDS serial interface has a maximum output data rate of 445.5 Mbps/ch and the number of output channels can be selected from 2ch, 4ch or 8ch. The MIPI CSI-2 interface has a maximum output data rate of 891 Mbps/lane and the number of output channels can be selected from 2 lanes or 4 lanes. The CMOS parallel interface has a maximum output data rate of 74.25 Mpixels/s.

＜Photograph 1＞ IMX290LQR Sample Image

Condition: 400 lx F1.4 (Full HD image, 60 frames/s)

IMX290LQR (Internal gain 0 dB)

＜Photograph 2＞ Comparisons with the Existing Sony Product

Condition1: 0.08 lx F1.4 (Full HD image, 30 frames/s)

Existing IMX236LQJ
Internal gain 48 dB

IMX290LQR
Internal gain 63 dB

Condition 2: 0 lx (850 nm IR) F1.4 (Full HD image, 30 frames/s)

Existing IMX236LQJ
Internal gain 0 dB

IMX290LQR
Internal gain 0 dB

＜Table 1＞ Device Structure

Item	IMX290LQR / IMX291LQR
Output Image size	Diagonal 6.46 mm (Type 1 / 2.8) (Full HD mode) Diagonal 4.31 mm (Type 1 / 4.2) (HD720p mode)
Number of effective pixels	1945 (H) × 1097 (V) approx. 2.13M pixels 1305 (H) × 729 (V) approx. 0.95M pixels
Unit cell size	2.9 µm (H) × 2.9 µm (V)
Optical blacks — Horizontal	Front: 0 pixels, rear: 0 pixels
Optical blacks — Vertical	Front:10 pixels, rear: 0 pixels
Input drive frequency	74.25 MHz / 37.125 MHz
Package	110-pin LGA
Supply voltage V_{DD} (Typ.)	2.9 V / 1.8 V / 1.2 V

＜Table 2＞ Image Sensor Characteristics

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	1300 mV	1/30s accumulation
Saturation signal	Min.	914 mV	Tj = 60 °C

＜Table 3＞ Basic Drive Mode

Drive mode	Interface	ADC	Frame rate (Max.)	Bit rate (Max.)
Full HD 1080p	Low voltage LVDS serial 8 ch	10 bit	120 frame/s	445.5 Mbps/ch
	Low voltage LVDS serial 8 ch	12 bit	60 frame/s	222.75 Mbps/ch
	CSI-2　4 lane	10 bit	120 frame/s	891 Mbps/lane
	CSI-2　4 lane	12 bit	60 frame/s	445.5 Mbps/lane
	CMOS parallel	10 bits / 12 bits	30 frame/s	74.25 Mpixel/s
HD720p	Low voltage LVDS serial 4 ch	10 bit	120 frame/s	594 Mbps/ch
	Low voltage LVDS serial 4 ch	12 bit	60 frame/s	297 Mbps/ch
	CSI-2　4 lane	10 bit	120 frame/s	594 Mbps/lane
	CSI-2　4 lane	12 bit	60 frame/s	297 Mbps/lane
	CMOS parallel	10 bits / 12 bits	60 frame/s	74.25 Mpixel/s

*Sony reserves the right to change products and specifications without prior notice.

Cameras Applications
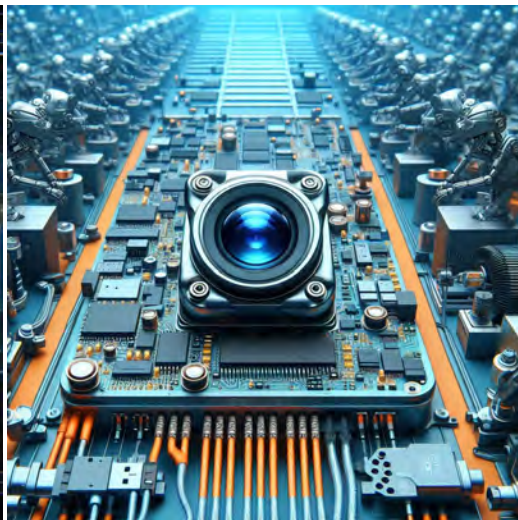

Automotive Driver Pilot

Live Streaming

Video Conference

Eye Tracker Biometric Detection

Machine Vision

Agricultural Monitor

Night Vision Security

Drone and Sports Eagle Eyes

Interactive Pet Camera

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

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

YDSCAM Package Solutions

YDS Camera Module

Complete with Lens Protection Film
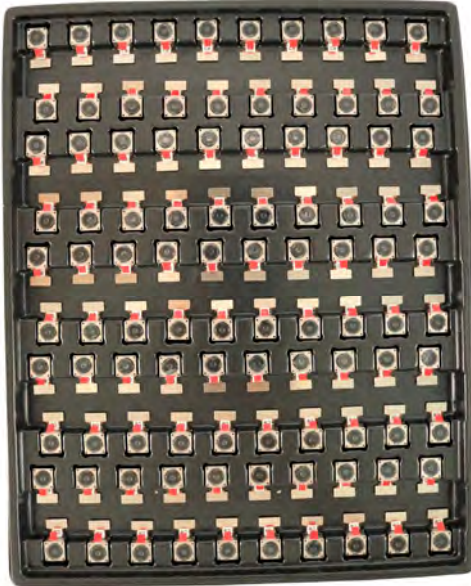

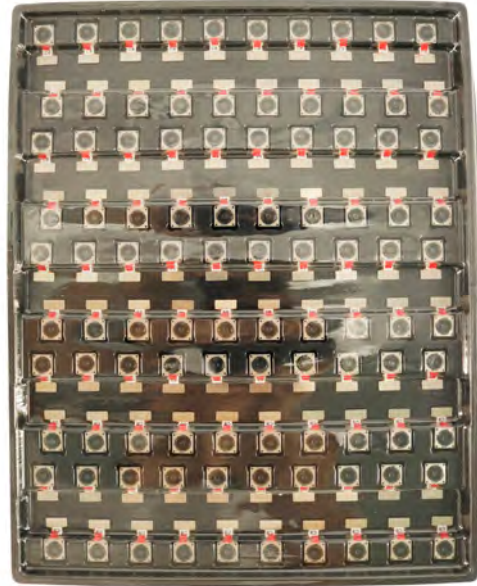Tray with Grid and Space

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

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

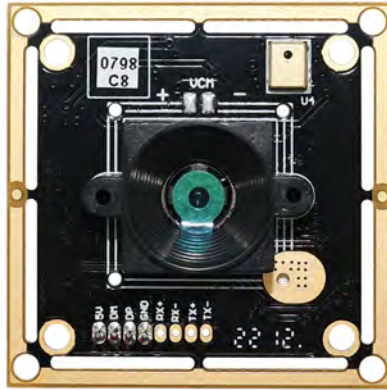Seal the Carbon Box

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

Place Connectors into Reel

Place Samples into the Carbon Box

Place Connectors into the Carbon Box

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

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
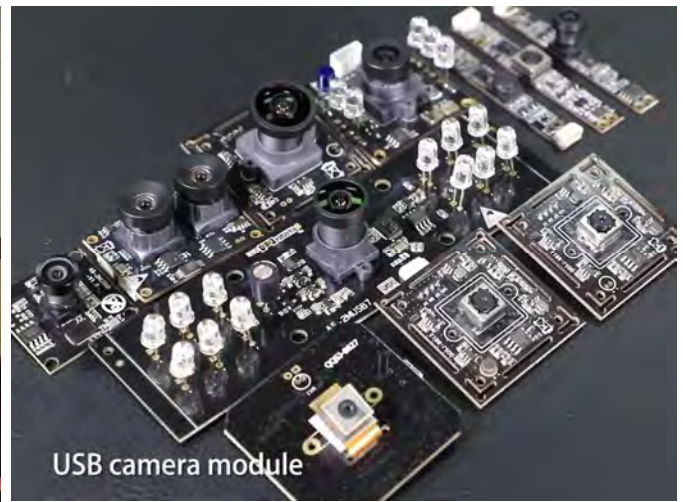
Limited Warranty

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