

YDS-ENT-IMX214 V1.0

13MP Sony IMX214 MIPI Interface Auto Focus Camera Module



Front View



Back View

Specifications

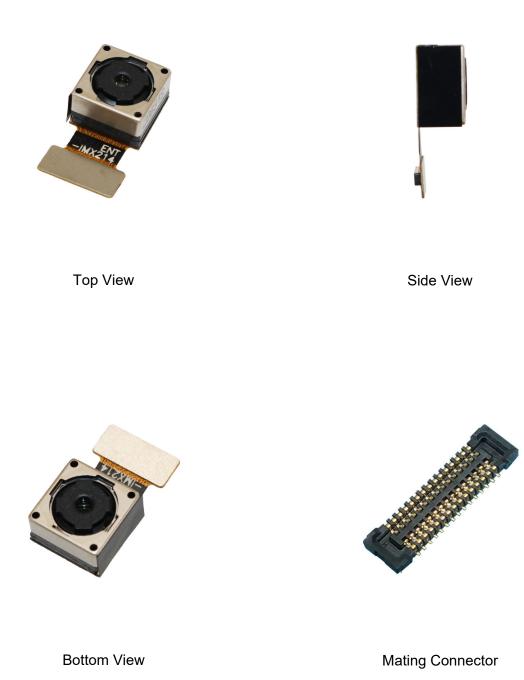
Camera Module No.	YDS-ENT-IMX214 V1.0				
Resolution	13MP				
Image Sensor	IMX214				
Sensor Type	1/3.06"				
Pixel Size	1.12 um x 1.12 um				
EFL	3.85 mm				
F.NO	2.20				
Pixel	4224 x 3136				
View Angle	74.4°(DFOV) 62.7°(HFOV) 48.7°(VFOV)				
Lens Dimensions	8.50 x 8.50 x 5.37 mm				
Module Size	16.07 x 9.00 mm				
Module Type	Auto Focus				
Interface	MIPI				
Auto Focus VCM Driver IC	FP5510				
Lens Model	YDS-LENS-50013A1				
Lens Type	650nm IR Cut				
Operating Temperature	-20°C to +70°C				
Mating Connector	BM20B(0.8)-30DS-0.4V(51)				

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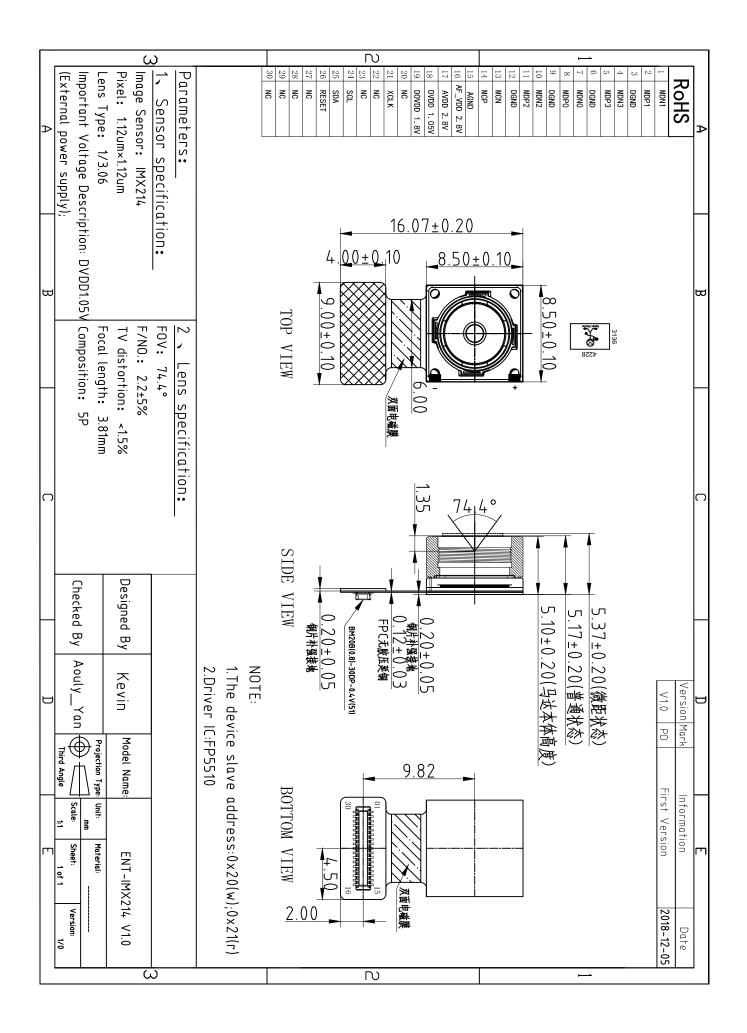


YDS-ENT-IMX214 V1.0

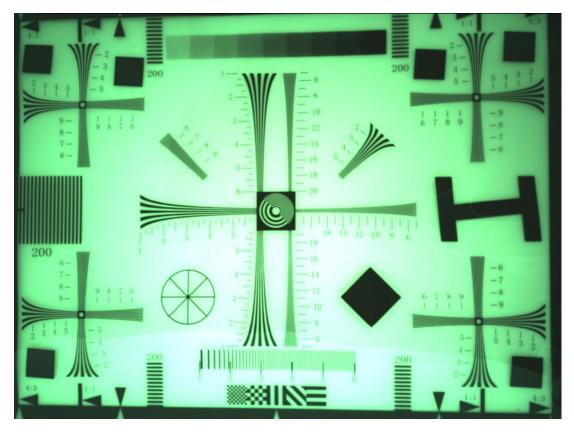
13MP Sony IMX214 MIPI Interface Auto Focus Camera Module

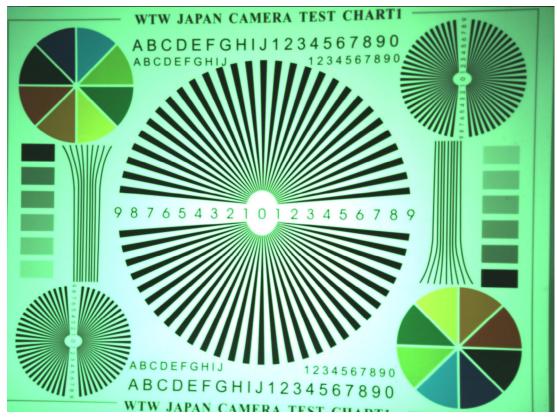


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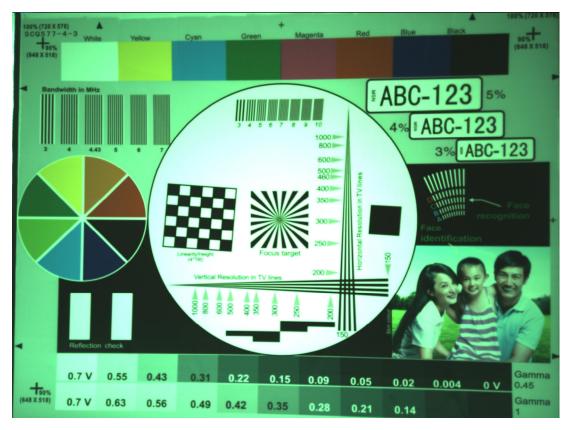


Real Test Images ENT-IMX214 V1.0



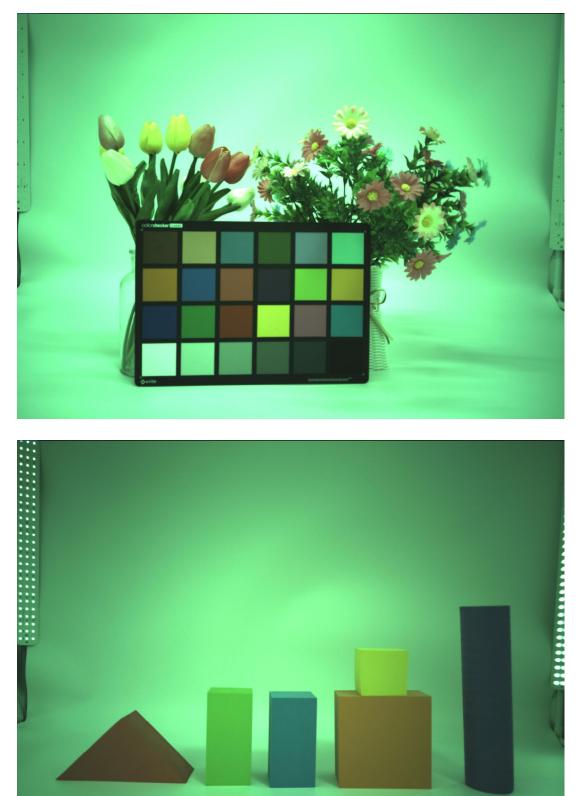


Real Test Images ENT-IMX214 V1.0



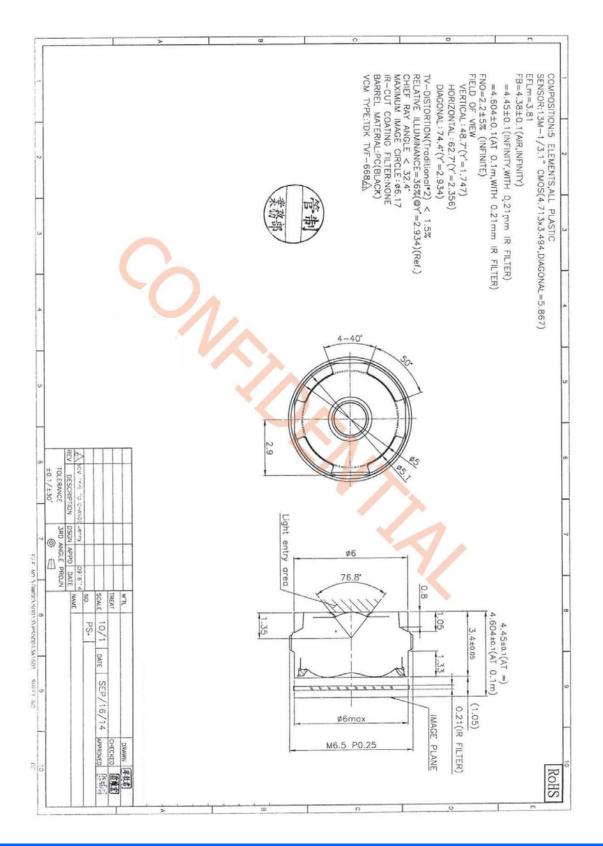


Real Test Images ENT-IMX214 V1.0





Lens Model: KLT-LENS-50013A1



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FP5510

10-Bit DAC 120mA VCM Driver with I²C Interface

Description

The FP5510 is a single 10-bit DAC with 120mA output current voice coil motor (VCM) driver, with an I^2 C-compatible serial interface that operates at clock rates up to 400kHz. Its supply operates from 2.3V to 3.6V.

The FP5510 incorporates with a power-on reset circuit, power-down function. Power-on reset circuit ensure when supply power up, DAC output is to 0V until valid write bit value takes place. In power down mode, the supply current is about 1μ A.

The FP5510 is designed for auto focus operation includes digital camera module, optical zoom camera phones and lens auto focus. The I^2C address of FP5510 is 0x18h.

The FP5510 with WLCSP package which it is suitable for reduced-space mounting in mobile phone and other portable applications.

Pin Assignments

6-Ball WLCSP

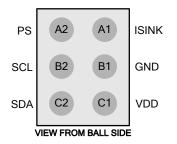


Figure 1. Pin Assignment of FP5510

Features

- Power Supply Voltage Rang: 2.3V to 3.6V
- VCM Driver for Auto-Focus
- 10-Bit Resolution Current Sinking of 120mA for VCM
- 2-Wire I²C Interface (1.8V Interface Compatible)
- Internal 4 Slope Control Mechanism
 - 1. Enhance Slope Control Mode
 - 2. One Step Mode
 - 3. Linear Slope Mode
 - 4. Two Step Slope Mode
- Power-Save Mode Current < 1µA
- Power On Reset (POR)
- Small Size: 0.7mm×1.1mm (6-Balls WLCSP)

Applications

- Digital Camera Module
- Cell Phone
- Lens Cover
- Web Camera

Ordering Information



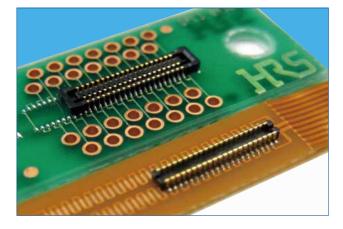
Package Type
 E2: WLCSP (6-Ball)

WLCSP-6 (0.7mmx1.1mm) Marking

Part Number	Product Code
FP5510E2	2

0.4mm Pitch, 0.6 and 0.8mm Height, Board-to-Board and Board-to-FPC Connectors

BM20 Series



Features

1. High density mounting capability

A space saving design that keeps the connector compact, but still maintains an adequate vacuum area (no less than 0.7mm wide). Depth DS : 2.3mm DP : 1.78mm

2. Reliable contact performance

Even though the mated height is low, the BM20 still leads it class in maximum effective mating lengths for each mating height.

<Effective Mating Length>

- Height 0.8mm : 0.2mm
- Height 0.6mm : 0.15mm

The addition of the two point contact system adds more reliability to the contacts.

3. No restrictions to PCB pattern design for the 0.8 mm height connector *1

This series utilizes a thin wall to insulate the bottom surface of the connector and maintains an effective mating length of 0.2mm. This removes any restriction for PCB pattern layout design under the connector.

Note *1: There are some restrictions for the 0.6 mm height style.

4. Enhanced mating operations

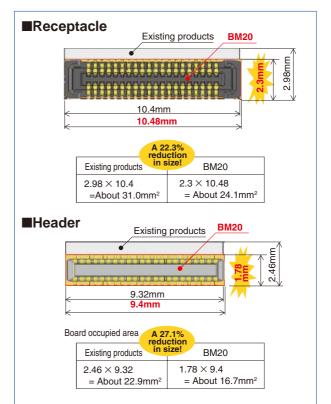
The structure uses guide ribs to ease the mating process and offers a self alignment range of up to 0.3mm. A clear tactile click is used as an indicator to the user that the mating process was completed.

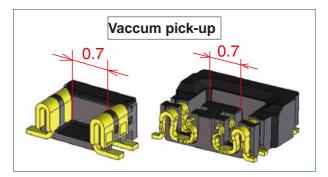
5. Drop and shock resistant structure

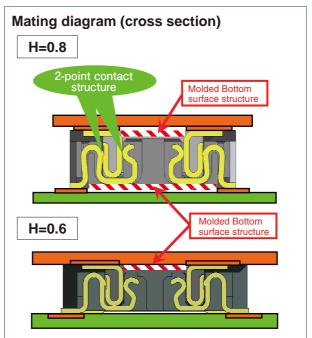
Dimples were designed into the contacts to increase their retention force and to absorb the shock delivered from a drop or other impact.

6. Debris resisting design

When mated, the connector's design covers the contacts which help to keep dust and other debris away from the contacts. The SMT leads are kept very close to the connector housing which also helps to prevent shorts caused by debris on the exposed contacts







Product Specifications

Ratings	Rated Cu	rrent 0.3A		Operating Temperature Range		~ 85°C ∋ 1)	Storage Temperature Range	- 10 ~ 60°C (Note 2)
. iainige	Rated Vol	tage	AC, DC 30V	Operating Humidity Range	20 ~	80%	Storage Humidity Range	40 ~ 70% (Note 2)
Item	าร		Sp	pecifications			Conditions	
1. Insulation F	Resistance	Min	imum of 50M Ω			Measure	ed with DC 100V	
2. Withstandi	ng Voltage	Not	flashover or brea	akdown		Apply A	C 100V for 1 minute	
3. Contact Re	esistance	Мах	kimum of 100ms	2		Measured with AC 20 mV, 1 kHz and 1 mA		
4. Vibration R	lesistance	No	electrical discon	tinuity of 1μ s or great	er	Frequency 10-55 Hz, half amplitude 0.75mm, 3 directions for 2 hours		
5. Humidity R	lesistance		Contact resistance Maximum of $100m\Omega$ Insulation resistance Minimum of $25m\Omega$			Left at temperature 40±2°C, humidity 90 to 95%, 96 hours		
6. Temperatu	re Cycles		Contact resistance Maximum of $100m\Omega$ Insulation resistance Minimum of $50m\Omega$			$\begin{array}{l} (-55^\circ C:30 \text{ minutes} \rightarrow 5{\sim}35^\circ C:10 \text{ minutes} \rightarrow 85^\circ C:\\ 30 \text{ minutes} \rightarrow 5{\sim}35^\circ C:10 \text{ minutes}) \ 5 \ \text{cycles} \end{array}$		
7. Durability		Contact Resistance: maximum of $100m\Omega$				10 mating cycles		
8. Soldering H Resistance			Should be no melting of resin parts that affects its performance			affects Reflow : according to the Recommended Solder Profil Hand solder : Soldering iron temperature 350°C, no more than 3 seconds.		

Note 1 : Includes temperature rise caused by current flow.

Note 2 : The term "storage" here refers to products stored for a long period prior to board mounting and use. The operating temperature and humidity range covers the non-energized condition of connectors after board mounting and the temporary storage conditions during transportation, etc.

Materials

Product	Component	Materials	Finish	UL Regulation
Receptacle	Insulator	LCP	Black	UL94V-0
Header	Contact	Phosphorous bronze	Gold plating	

Product Number Structure

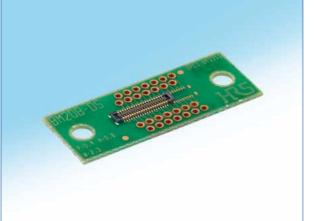
Refer to this page when determining product specifications by model types. Please place orders with part numbers listed in this catalog. The characteristics and specifications of the product described in this catalog are reference values. Please make sure to check the latest delivery specifications at the time of product use.

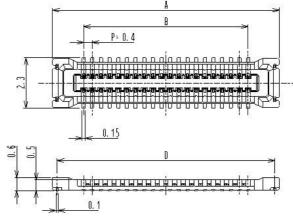
Receptacle/Header

B	Μ	20	#	(**)	-	*	DS	-	0.4	V	(51)	
		2	3	4		6	6		7	8	9	
1 Serie	s Na	me : BM					60	Connec	tor Type			
2 Series	s No.	. : 20						S : Do	uble row i	recepta	acle	

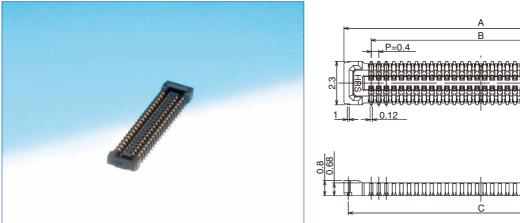
2 Series No. : 20	DS : Double row receptacle
3 Shape Symbols	DP : Double row header
B : With reinforcing metal fitting	Contact Pitch : 0.4mm
4 Stack height : 0.6mm, 0.8mm	8 Terminal Shape V : Vertical SMT
6 No. of Contacts : Please refer to page 3 and after.	 Packaging (51) : Embossed tape package (8,000 pieces per reel)

H=0.6mm receptacle

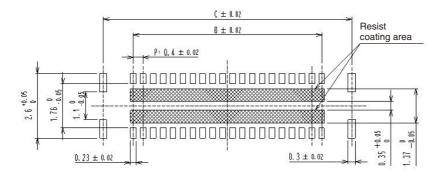




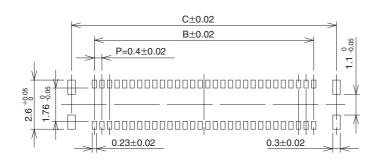
H=0.8mm receptacle



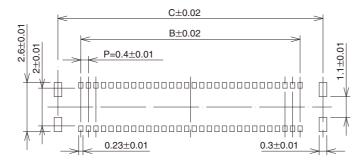
Recommended PCB layout (H= 0.6mm)



● Recommended PCB layout [H= 0.8mm]



●Recommended metal mask size (Mask thickness 100 µm) [0.6 mm and 0.8 mm common]



						Unit : mm
Part No.	HRS No.	No. of Contacts	А	В	С	D
BM20B(0.6)-10DS-0.4V(51)	0684-9308-8 51	10	4.48	1.6	4.02	4.06
BM20B(0.6)-20DS-0.4V(51)	0684-9309-0 51	20	6.48	3.6	6.02	6.06
BM20B(0.6)-24DS-0.4V(51)	0684-9310-0 51	24	7.28	4.4	6.82	6.86
BM20B(0.6)-30DS-0.4V(51)	0684-9311-2 51	30	8.48	5.6	8.02	8.06
BM20B(0.6)-34DS-0.4V(51)	0684-9312-5 51	34	9.28	6.4	8.82	8.86
BM20B(0.6)-40DS-0.4V(51)	0684-9313-8 51	40	10.48	7.6	10.02	10.06
BM20B(0.6)-50DS-0.4V(51)	0684-9314-0 51	50	12.48	9.6	12.02	12.06
BM20B(0.6)-60DS-0.4V(51)	0684-9315-3 51	60	14.48	11.6	14.02	14.06

Part No.	HRS No.	No. of Contacts	А	В	С
BM20B(0.8)-10DS-0.4V(51)	0684-9008-4 51	10	4.48	1.6	4.02
BM20B(0.8)-16DS-0.4V(51)	0684-9041-0 51	16	5.68	2.8	5.22
BM20B(0.8)-20DS-0.4V(51)	0684-9009-7 51	20	6.48	3.6	6.02
BM20B(0.8)-24DS-0.4V(51)	0684-9010-6 51	24	7.28	4.4	6.82
BM20B(0.8)-30DS-0.4V(51)	0684-9011-9 51	30	8.48	5.6	8.02
BM20B(0.8)-34DS-0.4V(51)	0684-9020-0 51	34	9.28	6.4	8.82
BM20B(0.8)-40DS-0.4V(51)	0684-9012-1 51	40	10.48	7.6	10.02
BM20B(0.8)-50DS-0.4V(51)	0684-9013-4 51	50	12.48	9.6	12.02

Note 1 : This product is sold by full reel quantities of 8,000 pieces per reel. Please place orders in full reel quantities. Note 2 : This connector is NOT polarized.

SONY

[Product Brief]

Ver.1.0

IMX214

Diagonal 5.867mm (Type 1/3.06) 13M Pixel CMOS Image Sensor with Square Pixel for Color Cameras

Description

IMX214 is a diagonal 5.867mm(Type 1/3.06) 13M pixel CMOS active pixel type stacked image sensor with a square pixel array. It adopts Exmor RS[™] technology to achieve high speed image capturing by column parallel A/D converter circuits and high sensitivity and low noise image (comparing with conventional CMOS image sensor) through the backside illuminated imaging pixel structure. R, G, and B pigment primary color mosaic filter is employed. By introducing spacially varying exposure technology, high dynamic range still pictures and movies are achievable. It equips an electronic shutter with variable integration time. It operates with three power supply voltages: analog 2.7 V, digital 1.0V and 1.8 V for input/output interface and achieves low power consumption. IMX214 is designed for use in cellular phones or tablet devices*.

Functions and Features

- Back illuminated and stacked CMOS image sensor Exmor RS
- Single Frame High Dynamic Range (HDR) with equivalent full pixels.
- High signal to noise ratio (SNR).
- Full resolution @30fps (Nornmal / HDR).4K2K @30fps (Normal / HDR)1080p @60fps (Normal / HDR)
- ◆ Output video format of RAW10/8, COMP8/6
- Pixel binning readout and H/V sub sampling function
- Advanced Noise Reduction (Chroma noise reduction and luminance noise reduction)
- Independent flipping and mirroring.
- CSI 2 serial data output (MIPI 2lane/4lane, Max. 1.2Gbps/lane, DPHY spec. ver. 1.1 compliant)
- 2wire serial communication
- Two PLLs for independent clock generation for pixel control and data output interface.
- Advanced Noise Reduction.
- ◆ Dynamic Defect Pixel Correction.
- Zero shutter lag.
- Power on reset function
- Dual sensor synchronization operation.
- 8K bit of OTP ROM for users.
- Built in temperature sensor

NOTE)

1. When using this product for another application, Sony does not guarantee the quality and reliability of product. Therefore, don't use this for applications other than cellular phone and Tablet PCs. Consult your Sony sales representative if you have any questions.

Device Structure

- CMOS image sensor
- Image size
- Total number of pixels
- Number of effective pixels
- Number of active pixels
- Chip size

Unit cell size

: 4208 (H) ×3120 (V) approx. 13.13 M pixels : 6.100mm (H) × 4.524mm (V)

: Diagonal 5.867mm (Type 1/3.06)

: 4224 (H) ×3200(V) approx. 13.51M pixels

: 4224 (H) ×3136 (V)approx. 13.25 M pixels

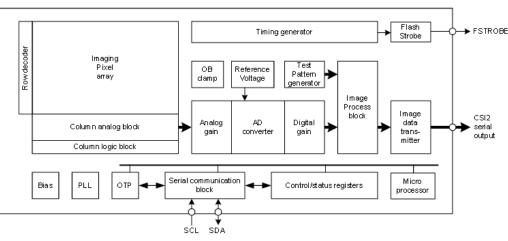
- : 1.12 μm (H) × 1.12 μm (V)
- Substrate material
- : 1.12 µ11 (□) * 1.12 : Silicon
- **Functional Description**

System Outline

IMX214 is a CMOS active pixel type image sensor which adopts the Exmor RS ™ technology to achieve high sensitivity, low noise and high speed image capturing. It is embedded with backside illuminated imaging pixel, low noise analog amplifier,

column parallel A/D converters which enables high speed capturing, digital amplifier, image binning circuit, timing control circuit for imaging size and frame rate, CSI2 image data high speed serial interface, PLL oscillator, and serial communication interface to control these functions.

Several additional image processing functions and peripheral circuits are also included for easy system optimization by the users. A one time programmable memory is embedded in the chip for storing the user data. It has 8 K-bit for users, 10 K-bit as a whole.



Block Diagram

Exmor RS

* Exmor RS is a trademark of Sony Corporation. The Exmor RS is a Sony's CMOS image sensor with high-resolution, high-performance and compact size by replacing a supporting substrate in Exmor R[™] which changed fundamental structure of Exmor[™] pixel adopted column parallel A/D converter to back-illuminated type, with layered chips formed signal processing circuits.

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Application circuits shown, if any, are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits.

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Cameras Applications

Y



Automotive Driver Pilot





Video Conference



Live Streaming

Eye Tracker Biometric Detection

Machine Vision

Agricultural Monitor



Night Vision Security

Drone and Sports Eagle Eyes



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Camera Module Pinout Definition Reference Chart

OmniVision Sony Samsung On-Semi Ap	tina 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 DM01N	MIPI 1st data lane negative output
MDP0 DP0 MD0P DATA P DM01P	MIPI 1st data lane positive output
MDN1 DN1 MD1N DATA2 N DMO2N	MIPI 2nd data lane negative output
MDP1 DP1 MD1P DATA2 P DM02P	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 D00 Y0	DV/P data output port 0
D1 D01 Y1	DVP data output port 0
D1 D01 Y1 D2 D02 Y2	DVP data output port 1 DVP data output port 2
D3 D03 Y3	
	DVP data output port 3
D4 D04 Y4 D5 D05 Y5	DVP data output port 4
	DVP data output port 5
D6 D06 Y6	DVP data output port 6
D7 D07 Y7	DVP data output port 7
D8 D08 Y8	DVP data output port 8
D9 D09 Y9	DVP data output port 9
D10 D010 Y10	DVP data output port 10
D11 D011 Y11	DVP data output port 11

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Camera Reliability Test

	Reliability Inspect	ion Item	Testing Mathed	Acceptones Criteria	
Cat	egory	Item	Testing Method	Acceptance Criteria	
	Storage	High 60°C 96 Hours	Temperature Chamber	No Abnormal Situation	
	Temperature	Low -20°C 96 Hours	Temperature Chamber	No Abnormal Situation	
	Operation	High 60°C 24 Hours	Temperature Chamber	No Abnormal Situation	
Environmental	Temperature	Low -20°C 24 Hours	Temperature Chamber	No Abnormal Situation	
Environmentai	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	
	Drop Test	Without Package 60cm	10 Times on Wood Floor	Electrically Functional	
	(Free Falling)	With Package 60cm	10 Times on Wood Floor	Electrically Functional	
	Vibration Test	50Hz X-Axis 2mm 30min	Vibration Table	Electrically Functional	
Physical		50Hz Y-Axis 2mm 30min	Vibration Table	Electrically Functional	
Filysical		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	
		Contact Discharge 2 KV	ESD Testing Machine	Electrically Functional	
	ESD Test	Air Discharge 4 KV	ESD Testing Machine	Electrically Functional	
Electrical	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	



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Camera Inspection Standard

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Inspection		n Item	Inspection Method	Standard of Inspection	
Categ	gory	Item	пересноп менной	Standard of Inspection	
		Color	The Naked Eye	Major Difference is Not Allowed.	
-	FPC/ PCB	Be Torn/Chopped	The Naked Eye	Copper Crack Exposure is Not Allowed.	
		Marking	The Naked Eye	Clear, Recognizable (Within 30cm Distance)	
		Scratches	The Naked Eye	The Inside Crack Exposure is Not Allowed	
	Holder	Gap	The Naked Eye	Meet the Height Standard	
Appearance	HOIDEI	Screw	The Naked Eye	Make Sure Screws Are Presented (If Any)	
		Damage	The Naked Eye	The Inside Crack Exposure is Not Allowed	
		Scratch	The Naked Eye	No Effect On Resolution Standard	
	Long	Contamination	The Naked Eye	No Effect On Resolution Standard	
	Lens	Oil Film	The Naked Eye	No Effect On Resolution Standard	
		Cover Tape	The Naked Eye	No Issue On Appearance.	
		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	
Function	Image	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	
		Height	The Naked Eye	Follows Approval Data Sheet	
Dimen	sion	Width	The Naked Eye	Follows Approval Data Sheet	
Dimen	131011	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



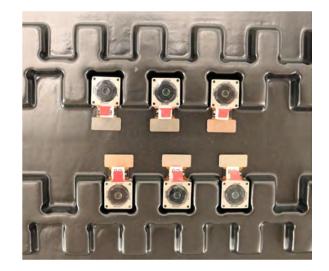
Tray with Grid and Space

Complete with Lens Protection Film



Place Cameras on the Tray





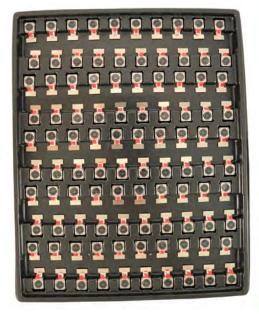
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YDSCAM Package Solutions

Full Tray of Cameras

DS



Place Tray into Anti-Static Bag

Cover Tray with Lid



Vacuum the Anti-Static Bag



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YDSCAM Package Solutions

Sealed Vacuum Anti-Static Bag with Labels

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



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YDSCAM Package Solutions

Place Foam Sheets Between Tray Bags



Place Foam Sheets and Trays into Box



Seal the Carbon Box



Foam Sheets are Larger Than Trays



Foam Sheets are Tightly Fitting in Box



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

USB Camera Module







Place Camera Sample into Anti-Static Bag

Place USB Cameras into Tray







Seal the Tray with Anti-Static Bag



Label the Carbon Shipping Box



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Complete with Lens Protection Film



YDSCAM Package Solutions

Place Camera Sample into Anti-Static Bag





Label the Sample Bags

Place Connectors into Anti-Static Bag



Place Connectors into Reel



Place Samples into the Carbon Box





Place Connectors into the Carbon Box



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YDS

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.



Limited Warranty

YDS provides the following limited warranty if you purchased the Product(s) directly from YDS company or from YDS's website <u>www.YDSCAM.com</u>. 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.



your best camera partner

YDS Strength

Y

Powerful Factory



Professional Service



Promised Delivery



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