

[Product Brief]

Ver.1.0

IMX220

Diagonal 7.87mm (Type 1/2.3) 20.7M Pixel CMOS Image Sensor with Square Pixel for Color Cameras

Description

IMX220 is a diagonal 7.87 mm (Type 1/2.3) 20.8M effective pixels stacked CMOS 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 specially 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 2.7V, digital 1.0V and 1.8V for input/output interface and achieves low power consumption.

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

Functions and Features

- ◆ Stacked CMOS image sensor Exmor RS
- ◆ Back-illuminated and active pixel type
- ◆ High Dynamic Range(HDR) and tone reproduction in movie mode
- ◆ High signal to noise ratio (SNR)
- ◆ Full resolution @12frame/s (Normal), 16:9 HV1/2 @30frame/s(Normal/HDR)
- ◆ Output video format of RAW10/8, ATR14/12, COMP8/6
- ◆ Pixel binning readout function
- ◆ Analog cropping and digital cropping
- ◆ Independent flipping and mirroring
- ◆ CSI-2 serial data output (MIPI-4Lane)
- ◆ 2-wire serial communication
- ◆ Two PLLs for independent clock generation for pixel control and data output interface
- ◆ Advanced Noise Reduction
- ◆ Dynamic Defect Pixel Correction (1Dementional / 2Dementional)
- ◆ Power-on reset function
- ◆ 4K bit of OTP ROM for users
- ◆ Built-in temperature sensor

Device Structure

◆ CMOS image sensor	
◆ Image size	: Diagonal 7.87mm (Type 1/2.3)
◆ Total number of pixels	: 5264(H) × 3992(V) approx. 21.01M pixels
◆ Number of effective pixels	: 5264(H) × 3960(V) approx. 20.84M pixels
◆ Number of active pixels	: 5248(H) × 3936(V) approx. 20.65M pixels
◆ Chip size	: 7.664mm (H) × 5.894mm (V)
◆ Unit cell size	: 1.2μm (H) × 1.2μm (V)
◆ Substrate material	: Silicon

Functional Description

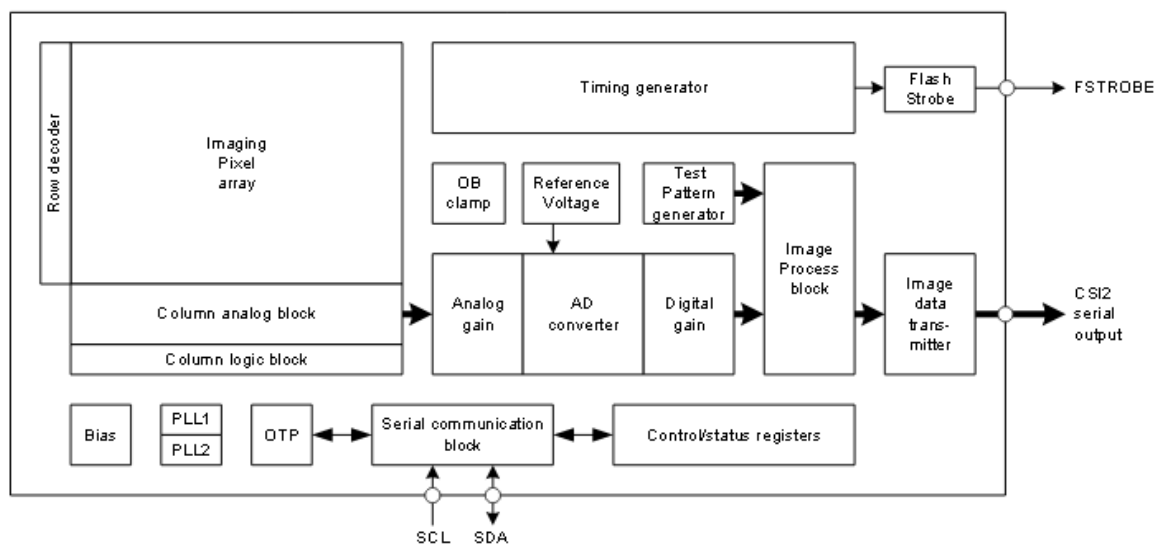
System Outline

IMX220 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 4 K-bit for users, 8 K-bit as a whole.

Overview of functional 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.