

[Product Information]

IMX677-AAPH5

Ver.1.1

Diagonal 7.85 mm (Type 1/2.3) CMOS Image Sensor with Square Pixel for Color Cameras

Description

The IMX677-AAPH5 is a diagonal 7.85 mm (Type 1/2.3) CMOS active pixel type stacked image sensor with a color square pixel array and approximately 23.91 M effective pixels. 12-bit digital output makes it possible to output the signals of approximately 23.91 M effective pixels with high definition for shooting still pictures. It operates with three power supply voltages : analog 2.8 V, digital 1.2 V, and 1.8 V for I/O interface and achieves low power consumption. Furthermore, it realizes 12-bit digital output for shooting high-speed and high-definition moving pictures by horizontal and vertical binning and subsampling readout. Realizing high-sensitivity, low dark current, this sensor also has an electronic shutter function with variable integration time. In addition, this product is designed for use in consumer use digital still camera and consumer use camcorder. When using this for another application, Sony Semiconductor Solutions Corporation does not guarantee the quality and reliability of the product. Therefore, don't use this for applications other than consumer use digital still camera and consumer use camcorder. In addition, individual specification change cannot be supported because this is a standard product. Consult your Sony Semiconductor Solutions Corporation sales representative if you have any questions.

Features

- ◆ Back-illuminated and stacked CMOS image sensor
- ◆ Input clock frequency 72 MHz
- ◆ All-pixel readout mode
 - Various readout modes (*)
- ◆ H driver, V driver and serial communication circuit on chip
- ◆ CDS/PGA on chip. Gain +27 dB (step pitch 0.2 dB)
- ◆ 10-bit/12-bit A/D conversion on chip
- ◆ Variable-speed shutter function (minimum unit: 1 horizontal sync signal period (1XHS))
- ◆ 8 / 4 Lane SLVS-EC output, support baud rates 4.608 / 2.304 Gbps
- ◆ Vertical and horizontal arbitrary cropping function
- ◆ Vertical and horizontal direction inverted readout mode
- ◆ Digital overlap (DOL) drive mode
- ◆ Multi Camera Function (chip ID up to six)
- ◆ Gyro data insertion function (Insert data from Gyro IC into frame data)
- ◆ R, G, B primary color mosaic filters on chip

* Please refer to the datasheet for binning/subsampling details of readout modes.

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Device Structure

◆ CMOS image sensor	
◆ Image size	Diagonal 7.85 mm (Type 1/2.3)
◆ Total number of pixels	5700 (H) × 5160 (V) approx. 29.41 M pixels
◆ Number of effective pixels	5663 (H) × 4223 (V) approx. 23.91 M pixels
◆ Number of active pixels	5599 (H) × 4223 (V) approx. 23.64 M pixels
◆ Chip size	9.280 mm (H) × 8.550 mm (V) (include scribe area)
◆ Unit cell size	1.12 μm (H) × 1.12 μm (V)
◆ Optical black	Vertical (V) direction : Front 40 pixels, rear 0 pixel

Image Sensor Characteristics

(T_j = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	803 LSB	1/30 s integration
Saturation signal	Min.	4039 LSB	

Basic Drive Mode

Drive mode	Number of active pixels	Max frame rate [frame/s]	Number of output bits [bit]
Readout mode 0	5599 (H) × 4223 (V) approx. 23.64 M pixels	55.10	12
Readout mode 1	5599 (H) × 4223 (V) approx. 23.64 M pixels	27.48	12
Readout mode 2	5599 (H) × 4223 (V) approx. 23.64 M pixels	73.50	12
Readout mode 3	5599 (H) × 4223 (V) approx. 23.64 M pixels	88.60	10
Readout mode 4	5599 (H) × 4223 (V) approx. 23.64 M pixels	44.19	10
Readout mode 5	5599 (H) × 4223 (V) approx. 23.64 M pixels	44.72	10
Readout mode 6	2799 (H) × 2111 (V) approx. 5.91 M pixels	175.98	12
Readout mode 7	2799 (H) × 2111 (V) approx. 5.91 M pixels	87.59	12
Readout mode 8	1865 (H) × 1405 (V) approx. 2.62 M pixels	132.50	12
Readout mode 9	1865 (H) × 1405 (V) approx. 2.62 M pixels	261.93	12
Readout mode 11	2799 (H) × 1405 (V) approx. 3.93 M pixels	261.93	10
Readout mode 14	1865 (H) × 209 (V) approx. 0.39 M pixels	1465.64	12
Readout mode 15	2799 (H) × 2111 (V) approx. 5.91 M pixels	175.66	10
Readout mode 16	2799 (H) × 2111 (V) approx. 5.91 M pixels	87.59	10
Readout mode 17	349 (H) × 209 (V) approx. 0.07 M pixels	1329.98	10
Readout mode 18	5599 (H) × 3119 (V) approx. 17.46 M pixels	120.22	10
Readout mode 19	2799 (H) × 4223 (V) approx. 11.82 M pixels	55.10	12
Readout mode 20	1865 (H) × 4223 (V) approx. 7.88 M pixels	55.10	12
Readout mode 21	2799 (H) × 4223 (V) approx. 11.82 M pixels	73.50	12
Readout mode 22	1865 (H) × 4223 (V) approx. 7.88 M pixels	73.50	12
Readout mode 23	2799 (H) × 4223 (V) approx. 11.82 M pixels	88.60	12
Readout mode 24	1865 (H) × 4223 (V) approx. 7.88 M pixels	88.60	12

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- ◆ Vertical and horizontal arbitrary cropping function
- ◆ Vertical and horizontal direction inverted readout mode
- ◆ Digital overlap (DOL) drive mode
- ◆ Multi Camera Function (chip ID up to six)
- ◆ Gyro data insertion function (Insert data from Gyro IC into frame data)
- ◆ R, G, B primary color mosaic filters on chip
- ◆ 148-pin high-precision ceramic package

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◆ Unit cell size	1.12 μm (H) × 1.12 μm (V)
◆ Optical black	Vertical (V) direction : Front 40 pixels, rear 0 pixel
◆ Package	148 pin LGA

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