

## [Product Information]

# IMX299CJK

Ver.1.0

Diagonal 21.63 mm (Type 4/3) CMOS Image Sensor with Square Pixel for Color Cameras

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### Description

The IMX299CJK is a diagonal 21.63 mm (Type 4/3) CMOS image sensor with a color square pixel array and approximately 10.71 M effective pixels. 12-bit digital output makes it possible to output the signals of approximately 9.07 M effective pixels (approx. 17:9 aspect ratio) with high definition for moving pictures. It also operates with three power supply voltages: analog 2.9 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 moving pictures by horizontal and vertical addition and subsampling. Realizing high-sensitivity, low dark current, this sensor also has an electronic shutter function with variable storage 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.

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### Features

- ◆ CMOS active pixel type pixels
- ◆ Input clock frequency 6 to 27 MHz (CSI-2), 72 MHz (SLVS-EC)
- ◆ Both MIPI Specifications (CSI-2 high-speed serial interface) and SLVS-EC interface supported
- ◆ Multi-Aspect (approx. 17:9 and 4:3)
- ◆ All-pixel scan mode (approx. 17:9 and 4:3)  
Various readout modes (\*)
- ◆ High-sensitivity, low dark current, no smear, excellent anti-blooming characteristics
- ◆ Vertical and horizontal arbitrary cropping function
- ◆ Variable-speed shutter function (minimum unit: 1 horizontal period)
- ◆ Low power consumption
- ◆ High dynamic range (HDR) function
- ◆ H driver, V driver and serial communication circuit on chip
- ◆ CDS/PGA on chip: Gain +27 dB (step pitch 0.1 dB)
- ◆ 10-bit/12-bit/14-bit A/D conversion on chip
- ◆ R, G, B primary color mosaic filters on chip (Quad Bayer structure)
- ◆ All-pixel simultaneous reset supported
- ◆ 248-pin high-precision ceramic package

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

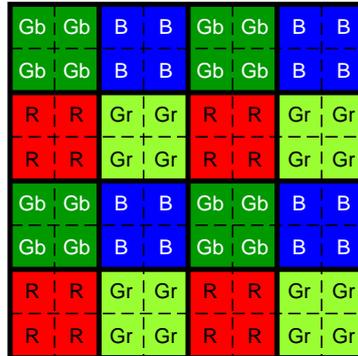
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## Device Structure

### ◆ CMOS image sensor (Quad Bayer structure)

Quad Bayer structure is constructed of 4 same color pixels into which 1 pixel of bayer pixel array is divided as following figure.



Quad Bayer Structure

HDR function is available by dividing exposure time in the 4 same color pixels into long exposure pixels and short exposure pixels.

When normal operation, 4 same color pixels are added and made 1 pixel, and output as bayer pixel array.

In addition, a group of divided 4 same color pixels is defined as 1 pixel unit in this product specification.

### ◆ Image size

Diagonal 21.63 mm (Type 4/3) Multi-Aspect (Aspect ratio 4:3 and approx. 17:9)

### ◆ Total number of pixels

- Aspect ratio approx. 17:9 : 4200 (H) × 2184 (V) approx. 9.17 M pixels
- Aspect ratio 4:3 : 3840 (H) × 2840 (V) approx. 10.91 M pixels

### ◆ Number of effective pixels

- Aspect ratio approx. 17:9 : 4168 (H) × 2176 (V) approx. 9.07 M pixels
- Aspect ratio 4:3 : 3792 (H) × 2824 (V) approx. 10.71 M pixels

### ◆ Number of active pixels

- Aspect ratio approx. 17:9 : 4120 (H) × 2168 (V) approx. 8.93 M pixels diagonal 21.56 mm
- Aspect ratio 4:3 : 3728 (H) × 2814 (V) approx. 10.49 M pixels diagonal 21.63 mm

### ◆ Number of recommended recording pixels

- Aspect ratio approx. 17:9 : 4096 (H) × 2160 (V) approx. 8.85 M pixels
- Aspect ratio 4:3 : 3704 (H) × 2778 (V) approx. 10.29 M pixels

### ◆ Chip size

24.553 mm (H) × 20.013 mm (V) (include scribe area)

### ◆ Unit cell size

4.63 μm (H) × 4.63 μm (V)

### ◆ Optical black

- Horizontal (H) direction : Front 0 pixel, rear 0 pixel
- Vertical (V) direction : Front 16 pixels, rear 0 pixel

### ◆ Package

248 pin LGA

**Image Sensor Characteristics**

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	1768 digit	1/30 s integration
Saturation signal	Min.	3895 digit	

**Basic Drive Mode**

**Type 4/3 Aspect Ratio Approx. 17:9 (Approx. 9.07 M pixels)**

Drive mode	Number of recording pixels	Max frame rate [frame/s]		Output data bit length [bit]
		(CSI-2)	(SLVS-EC)	
Readout mode 1	4096 (H) × 2160 (V) approx. 8.85 M pixels	57.76	89.71	12
Readout mode 1A	4096 (H) × 2160 (V) approx. 8.85 M pixels	54.37	54.56	12
Readout mode 1B	3840 (H) × 2160 (V) approx. 8.29 M pixels	61.43	-	12
Readout mode 2	4096 (H) × 2160 (V) approx. 8.85 M pixels	68.13	125.08	10
Readout mode 2A	4096 (H) × 2160 (V) approx. 8.85 M pixels	67.63	78.65	10
Readout mode 3	2048 (H) × 1080 (V) approx. 2.21 M pixels	88.84	91.46	14
Readout mode 4	2048 (H) × 1080 (V) approx. 2.21 M pixels	88.84	91.96	12
Readout mode 5	2048 (H) × 1080 (V) approx. 2.21 M pixels	103.32	124.18	12
Readout mode 6	2048 (H) × 1080 (V) approx. 2.21 M pixels	120.61	124.85	10
Readout mode 7	2048 (H) × 1080 (V) approx. 2.21 M pixels	241.22	247.70	10
Readout mode 8	1364 (H) × 720 (V) approx. 0.98 M pixels	117.14	122.42	12
Readout mode 9	1364 (H) × 720 (V) approx. 0.98 M pixels	351.43	365.33	12
Readout mode 10	1364 (H) × 240 (V) approx. 0.33 M pixels	461.54	362.94	12
Readout mode 11	1364 (H) × 240 (V) approx. 0.33 M pixels	58.08	67.35	10

**Type 4/3 Aspect Ratio 4:3 (Approx. 10.71 M pixels)**

Drive mode	Number of recording pixels	Max frame rate [frame/s]		Output data bit length [bit]
		(CSI-2)	(SLVS-EC)	
Readout mode 0	3704 (H) × 2778 (V) approx. 10.29 M pixels	28.82	29.00	14
Readout mode 1	3704 (H) × 2778 (V) approx. 10.29 M pixels	48.22	71.07	12
Readout mode 1A	3704 (H) × 2778 (V) approx. 10.29 M pixels	41.83	42.09	12
Readout mode 7	1852 (H) × 1388 (V) approx. 2.57 M pixels	190.19	194.20	10
Readout mode 10	1234 (H) × 308 (V) approx. 0.38 M pixels	376.25	413.32	12