

## [Product Information]

# IMX377CQT

Ver.1.0

Diagonal 7.81 mm (Type 1/2.3) CMOS Image Sensor with Square Pixel for Color Cameras

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### Description

The IMX377CQT is a diagonal 7.81 mm (Type 1/2.3) CMOS image sensor with a color square pixel array and approximately 12.35 M effective pixels. 12-bit digital output makes it possible to output the signals of approximately 12.35 M effective pixels with high definition for shooting still pictures. It also 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 addition and subsampling. 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 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
- ◆ MIPI Specifications (CSI-2 high-speed serial interface)
- ◆ All-pixel scan mode
  - 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
- ◆ H driver, V driver and I<sup>2</sup>C communication circuit on chip
- ◆ CDS/PGA on chip: Gain +27 dB (step pitch 0.1 dB)
- ◆ 10-bit/12-bit A/D conversion on chip
- ◆ R, G, B primary color mosaic filters on chip
- ◆ All-pixel simultaneous reset supported
- ◆ 98-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
- ◆ Image size Diagonal 7.81 mm (Type 1/2.3)
- ◆ Total number of pixels 4152 (H) × 3062 (V) approx. 12.71 M pixels
- ◆ Number of effective pixels
  - Type 1/2.3 approx. 12.35 M pixels use 4056 (H) × 3046 (V) approx. 12.35 M pixels
  - Type 1/2.5 approx. 9.03 M pixels use 4152 (H) × 2174 (V) approx. 9.03 M pixels
- ◆ Number of active pixels
  - Type 1/2.3 approx. 12.35 M pixels use 4024 (H) × 3036 (V) approx. 12.22 M pixels diagonal 7.81 mm
  - Type 1/2.5 approx. 9.03 M pixels use 4120 (H) × 2168 (V) approx. 8.93 M pixels diagonal 7.22 mm
- ◆ Number of recommended recording pixels
  - Type 1/2.3 approx. 12.35 M pixels use 4000 (H) × 3000 (V) 12.00 M pixels aspect ratio 4:3
  - Type 1/2.5 approx. 9.03 M pixels use 4096 (H) × 2160 (V) approx. 8.85 M pixels aspect ratio approx. 17:9
- ◆ Chip size 10.200 mm (H) × 8.000 mm (V) (include scribe area)
- ◆ Unit cell size 1.55 μm (H) × 1.55 μm (V)
- ◆ Optical black
  - Horizontal (H) direction : Front 0 pixel, rear 0 pixel
  - Vertical (V) direction : Front 16 pixels, rear 0 pixel
- ◆ Package 98 pin LGA

**Image Sensor Characteristics**

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	976 digit	1/30 s integration
Saturation signal	Min.	2799 digit	

## Basic Drive Mode

### Type 1/2.3 Approx. 12.35 M Pixels (4:3)

Drive mode	Number of recording pixels	Max frame rate [frame/s]	Output data bit length [bit]
Readout mode 0	4000 (H) × 3000 (V) 12.00 M pixels	34.97	12
Readout mode 1	4000 (H) × 3000 (V) 12.00 M pixels	39.96	10
Readout mode 1A	4000 (H) × 3000 (V) 12.00 M pixels	29.97	10
Readout mode 2	2000 (H) × 1500 (V) 3.00 M pixels	59.94	12
Readout mode 3	1332 (H) × 998 (V) approx. 1.33 M pixels	59.94	12
Readout mode 4	1332 (H) × 1000 (V) approx. 1.33 M pixels	239.76	12
Readout mode 5	2000 (H) × 750 (V) 1.50 M pixels	239.76	10
Readout mode 6	1332 (H) × 332 (V) approx. 0.44 M pixels	299.70	12
Readout mode 7	1332 (H) × 332 (V) approx. 0.44 M pixels	29.97	12
Readout mode 8	1332 (H) × 174 (V) approx. 0.23 M pixels	659.34	12

### Type 1/2.5 Approx. 9.03 M Pixels (Approx. 17:9)

Drive mode	Number of recording pixels	Max frame rate [frame/s]	Output data bit length [bit]
Readout mode 0	4096 (H) × 2160 (V) approx. 8.85 M pixels	29.97	12
Readout mode 1	3840 (H) × 2160 (V) approx. 8.29 M pixels	59.94	10
Readout mode 1A	3840 (H) × 2160 (V) approx. 8.29 M pixels	59.94	10
Readout mode 2	2048 (H) × 1080 (V) approx. 2.21 M pixels	119.88	12
Readout mode 2A	2048 (H) × 1080 (V) approx. 2.21 M pixels	119.88	12
Readout mode 3	1364 (H) × 720 (V) approx. 0.98 M pixels	119.88	12
Readout mode 4	1364 (H) × 720 (V) approx. 0.98 M pixels	299.70	12
Readout mode 6	1364 (H) × 240 (V) approx. 0.33 M pixels	419.58	12
Readout mode 8	1364 (H) × 124 (V) approx. 0.17 M pixels	839.16	12