SONY

Ver.2.0

IMX678-AAQR1

Diagonal 8.86 mm (Type 1/1.8) CMOS Solid-state Image Sensor with Square Pixel for Color Cameras

Description

The IMX678-AAQR1 is a diagonal 8.86 mm (Type 1/1.8) CMOS active pixel type solid-state image sensor with a square pixel array and 8.40 M effective pixels. This chip operates with analog 3.3 V, digital 1.1 V, and interface 1.8 V triple power supply, and has low power consumption. High sensitivity, low dark current and no smear are achieved through the adoption of R, G and B primary color mosaic filters. This chip features an electronic shutter with variable charge-integration time.

(Applications: Security cameras)

Features

◆ CMOS active pixel type dots

◆ Built-in timing adjustment circuit, H/V driver and serial communication circuit

◆ Input frequency: 13.5MHz / 18MHz / 24MHz / 27MHz / 36MHz / 37.125 MHz / 72 MHz / 74.25 MHz

◆ Number of recommended recording pixels: 3840 (H) × 2160 (V) approx. 8.29M pixel

◆ Readout mode All-pixel scan mode

Horizontal / Vertical 2/2-line binning mode

Window cropping mode

Horizontal / Vertical direction - Normal / Inverted readout mode

◆ Readout rate Maximum frame rate in All-pixel scan mode: 12 bit: 60 frame/s, 10 bit: 72 frame/s

♦ High dynamic range (HDR) function

Digital overlap HDR

Clear HDR

- ◆ Synchronizing sensors function
- ◆ Variable-speed shutter function (resolution 1H units)
- ◆ CDS / PGA function 0 dB to 30 dB: Analog Gain 30 dB (step pitch 0.3 dB)

30.3 dB to 72 dB: Analog Gain 30 dB + Digital Gain 0.3 dB to 42 dB (step pitch 0.3 dB)

◆ Supports I/O

CSI-2 serial data output (2 Lane / 4 Lane / 8Lane / 4Lane × 2ch)

RAW10 / RAW12 output

STARVIS 2

* STARVIS 2 and STARVIS 2 are registered trademarks or trademarks of Sony Group Corporation or its affiliates. The STARVIS 2 is back-illuminated pixel technology used in CMOS image sensors for security camera applications. It features a sensitivity of 2000 mV or more per 1 µm2 (color product, when imaging with a 706 cd/m2 light source, F5.6 in 1 s accumulation equivalent). It also has a wide dynamic range (AD 12 bit) of more than 8 dB compared to STARVIS for the same pixel size in a single exposure, and achieves high picture quality in the visible-light and near infrared light regions.

Sony reserves the right to change products and specifications without prior notice.

"Sony", "SONY" logo are registered trademarks or trademarks of Sony Group Corporation or its affiliates.

Device Structure

◆ CMOS image sensor

♦ Image size Diagonal 8.86 mm (Type 1/1.8) approx. 8.40 M pixels, All pixels

◆ Total number of pixels
♦ Number of effective pixels
♦ Number of active pixels
♦ Number of active pixels
♦ Number of recommended recording pixels
3856 (H) × 2180 (V) approx. 8.40 M pixels
♦ Number of recommended recording pixels
3840 (H) × 2160 (V) approx. 8.29 M pixels

♦ Unit cell size 2.0 μm (H) × 2.0 μm (V)

♦ Optical black Horizontal (H) direction: Front 0 pixels, rear 0 pixels

Vertical (V) direction: Front 20 pixels, rear 0 pixels

◆ Dummy Horizontal (H) direction: Front 0 pixels, rear 0 pixels

Vertical (V) direction: Front 0 pixels, rear 0 pixels

◆ Package 132 pin LGA

Image Sensor Characteristics

(Tj = 60 °C)

Item		Value	Remarks	
Sensitivity (F5.6)	Тур.	15886 Digit/lx/s	12 bit converted value	
Saturation signal	Min.	3895 Dight	12 bit converted value	

Basic Drive Mode

Drive mode	Recommended number of recording pixels	Maximum frame rate [frame/s]	Output interface	ADC [bit]
All-pixel	3840 (H) × 2160 (V) approx. 8.29 M pixels	72	CSI-2	10
Horizontal/ Vertical 2/2-line binning	1920 (H) × 1080 (V) approx. 2.07 M pixels	72	CSI-2	10

SONY IMX678-AAQR1

Comparison Image under 0.2 lux

Gain setting of IMX334 is 4times of IMX678, however they can get same output brightness.





IMX334

Condition: F1.6, exposure time 33.3 ms, gain 60 dB

IMX678

Condition: F1.6, exposure time 33.3 ms, gain 48 dB

Comparison Image under NIR at 850 nm



IMX334

Condition: F1.6, exposure time 33.3 ms, gain 0 dB



IMX678

Condition: F1.6, exposure time 33.3 ms, gain 0 dB

