

[Product Information]

IMX415-AAQR

Ver.1.0

Diagonal 6.43 mm (Type 1/2.8) CMOS Solid-state Image Sensor with Square Pixel for Color Cameras

Description

The IMX415-AAQR is a diagonal 6.4 mm (Type 1/2.8) CMOS active pixel type solid-state image sensor with a square pixel array and 8.46 M effective pixels. This chip operates with analog 2.9 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: Surveillance cameras, FA cameras, Industrial cameras)

Features

- ◆ CMOS active pixel type dots
- ◆ Built-in timing adjustment circuit, H/V driver and serial communication circuit
- ◆ Input frequency: 24 MHz / 27 MHz / 37.125 MHz / 72 MHz / 74.25 MHz
- ◆ Number of recommended recording pixels: 3840 (H) × 2160 (V) approx. 8.29 M pixels
- ◆ 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: 60.3 frame/s, 10 bit: 90.9 frame/s
- ◆ High dynamic range (HDR) function
 - Multiple exposure HDR
 - Digital overlap 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), RAW10 / RAW12 output
- ◆ Recommended exit pupil distance: -30 mm to $-\infty$

STARVIS

* STARVIS is a trademark of Sony Corporation. The STARVIS is back-illuminated pixel technology used in CMOS image sensors for surveillance camera applications. It features a sensitivity of 2000 mV or more per $1 \mu\text{m}^2$ (color product, when imaging with a 706 cd/m^2 light source, F5.6 in 1 s accumulation equivalent), and realizes high picture quality in the visible-light and near infrared light regions.

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Sony logo is a registered trademark of Sony Corporation.

Device Structure

- ◆ CMOS image sensor
- ◆ Image size Diagonal 6.4 mm (Type 1/2.8) approx. 8.40 M pixels, All pixels
- ◆ Total number of pixels 3864 (H) × 2228 (V) approx. 8.60 M pixels
- ◆ Number of effective pixels 3864 (H) × 2192 (V) approx. 8.46 M pixels
- ◆ Number of active pixels 3864 (H) × 2176 (V) approx. 8.40 M pixels
- ◆ Number of recommended recording pixels 3840 (H) × 2160 (V) approx. 8.29 M pixels
- ◆ Unit cell size 1.45 μm (H) × 1.45 μm (V)
- ◆ Optical black Horizontal (H) direction: Front 0 pixel, rear 0 pixel
Vertical (V) direction: Front 36 pixels, rear 0 pixel
- ◆ Dummy Horizontal (H) direction: Front 0 pixel, rear 0 pixel
Vertical (V) direction: Front 1 pixel, rear 1 pixel
- ◆ Package 114 pin LGA

Image Sensor Characteristics

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	2048 Digit	1/30 s accumulation 12 bit converted value
Saturation signal	Min.	3895 Digit	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	90.9	CSI-2	10
Horizontal/ Vertical 2/2-line binning	1920 (H) × 1080 (V) approx. 2.07 M pixels	90.9	CSI-2	10

[Product Information]

IMX415-AAMR

Ver.1.0

Diagonal 6.43 mm (Type 1/2.8) CMOS Solid-state Image Sensor with Square Pixel for Monochrome Cameras

Description

The IMX415-AAMR is a diagonal 6.4 mm (Type 1/2.8) CMOS active pixel type solid-state image sensor with a square pixel array and 8.46 M effective pixels. This chip operates with analog 2.9 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. This chip features an electronic shutter with variable charge-integration time.

(Applications: Surveillance cameras, FA cameras, Industrial cameras)

Features

- ◆ CMOS active pixel type dots
- ◆ Built-in timing adjustment circuit, H/V driver and serial communication circuit
- ◆ Input frequency: 24 MHz / 27 MHz / 37.125 MHz / 72 MHz / 74.25 MHz
- ◆ Number of recommended recording pixels: 3840 (H) × 2160 (V) approx. 8.29 M pixels
- ◆ Readout mode
 - All-pixel scan mode
 - 2 × 2 adjacent pixel binning mode
 - Window cropping mode
 - Horizontal / Vertical direction - Normal / Inverted readout mode
- ◆ Readout rate
 - Maximum frame rate in
 - All-pixel scan mode: 12 bit: 60.3 frame/s, 10 bit: 90.9 frame/s
- ◆ High dynamic range (HDR) function
 - Multiple exposure HDR
 - Digital overlap 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), RAW10 / RAW12 output
- ◆ Recommended exit pupil distance: -100 mm to $-\infty$

STARVIS

* STARVIS is a trademark of Sony Corporation. The STARVIS is back-illuminated pixel technology used in CMOS image sensors for surveillance camera applications. It features a sensitivity of 2000 mV or more per $1 \mu\text{m}^2$ (color product, when imaging with a 706 cd/m² light source, F5.6 in 1 s accumulation equivalent), and realizes high picture quality in the visible-light and near infrared light regions.

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Device Structure

- ◆ CMOS image sensor
- ◆ Image size Diagonal 6.4 mm (Type 1/2.8) approx. 8.40 M pixels, All pixels
- ◆ Total number of pixels 3864 (H) × 2228 (V) approx. 8.60 M pixels
- ◆ Number of effective pixels 3864 (H) × 2192 (V) approx. 8.46 M pixels
- ◆ Number of active pixels 3864 (H) × 2176 (V) approx. 8.40 M pixels
- ◆ Number of recommended recording pixels 3840 (H) × 2160 (V) approx. 8.29 M pixels
- ◆ Unit cell size 1.45 μm (H) × 1.45 μm (V)
- ◆ Optical black
Horizontal (H) direction: Front 0 pixel, rear 0 pixel
Vertical (V) direction: Front 36 pixels, rear 0 pixel
- ◆ Dummy
Horizontal (H) direction: Front 0 pixel, rear 0 pixel
Vertical (V) direction: Front 1 pixel, rear 1 pixel
- ◆ Package 114 pin LGA

Image Sensor Characteristics

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F8)	Typ.	1570 Digit	1/30 s accumulation 12 bit converted value
Saturation signal	Min.	3895 Digit	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	90.9	CSI-2	10
2 × 2 adjacent pixel binning	1920 (H) × 1080 (V) approx. 2.07 M pixels	90.9	CSI-2	10