

Ver.1.0

Diagonal 14.0 mm (Type 1/1.1) CMOS solid-state Image Sensor with Square Pixel for Monochrome Cameras

### Description

The IMX535-AAMJ is a diagonal 14.0 mm (Type 1/1.1) CMOS active pixel type solid-state image sensor with a square pixel array and 12.41 M effective pixels. This chip features a global shutter with variable charge-integration time. This chip operates with analog 3.3 V, 2.9 V, digital 1.1 V, and interface 1.8 V quadruple power supply. High sensitivity and low dark current characteristics are achieved.

(Applications: FA cameras, ITS cameras)

### Features

- ◆ CMOS active pixel type dots
- ◆ Built-in timing adjustment circuit, H/V driver and serial communication circuit
- ◆ Global shutter function
- ◆ Input frequency 37.125 MHz / 74.25 MHz / 54 MHz
- ◆ Number of recommended recording pixels: 4096 (H) × 3000 (V) approx. 12.28 M pixels
- ◆ Readout mode
  - All-pixel scan mode
  - Vertical / Horizontal 1/2 Subsampling mode
  - 2 × 2 FD binning mode
  - ROI mode
  - Vertical / Horizontal - Normal / Inverted readout mode
- ◆ Readout rate
  - Maximum frame rate in
  - All-pixel scan mode: 8 bit 184.6 frame/s, 10 bit 183.9 frame/s, 12 bit 120.9 frame/s
- ◆ Pulse Output Function
  - The monitor output for Exposure period
  - Programmable pulse output
- ◆ 8-bit / 10-bit / 12-bit A/D converter
- ◆ CDS / PGA function
  - 0 dB to 24 dB: Analog Gain (0.1 dB step)
  - 24.1 dB to 48 dB: Analog Gain: 24 dB + Digital Gain: 0.1 dB to 24 dB (0.1 dB step)
- ◆ I/O interface
  - SLVS (4 ch / 8 ch switching) output (594 / 297 / 891 / 445.5 Mbps per ch)
  - SLVS - EC (1 Lane / 2 Lane / 4 Lane / 8 Lane) output (4.752 / 2.376 / 1.188 Gbps per Lane)
- ◆ Recommended lens F number: 2.8 or more (Close side)

### Pregius S

\* Pregius S is a trademark of Sony Corporation. Pregius S is a global shutter sensor technology for active pixel-type CMOS image sensors. By Stacking the signal processing on the back illuminated type CMOS Image Sensor it realises small chip size and high sensitivity, whilst using the high picture quality global shutter pixel technology of Pregius.

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

Sony logo is a registered trademark of Sony Corporation.

**Device Structure**

◆ CMOS image sensor			
◆ Image size	Diagonal 14.0 mm (Type 1/1.1)	Approx. 12.41 M pixels	All-pixel
◆ Total number of pixels	4128 (H) × 3072 (V)	Approx. 12.68 M pixels	
◆ Number of effective pixels	4128 (H) × 3008 (V)	Approx. 12.41 M pixels	
◆ Number of active pixels	4128 (H) × 3008 (V)	Approx. 12.41 M pixels	
◆ Number of recommended recording pixels	4096 (H) × 3000 (V)	Approx. 12.28 M pixels	All-pixel
◆ Unit cell size	2.74 μm (H) × 2.74 μm (V)		
◆ Optical black	Horizontal (H) direction: Front 0 pixel, rear 0 pixel Vertical (V) direction: Front 64 pixels, rear 0 pixel		
◆ Package	230 pin LGA	20.0 mm (H) × 16.8 mm (V)	

**Image Sensor Characteristics**

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	14510 Digit/lx/s	
Saturation signal	Min.	4094 Digit	

**Basic Drive Mode**

Drive mode	Recommended number of recording pixels	Maximum frame rate [frame/s]	Output interface	ADC [bit]
All pixel	4096 (H) × 3000 (V) approx. 12.28 M pixels	60	SLVS 8 ch	8
		184	SLVS – EC 8 Lane	
		49	SLVS 8 ch	10
		183	SLVS – EC 8 Lane	
		41	SLVS 8 ch	12
		120	SLVS – EC 8 Lane	
Vertical / Horizontal 1/2 subsampling	2048 (H) × 1500 (V) approx. 3.07 M pixels	205	SLVS 8 ch	8
		616	SLVS – EC 8 Lane	
		170	SLVS 8 ch	10
		592	SLVS – EC 8 Lane	
		145	SLVS 8 ch	12
		430	SLVS – EC 8 Lane	
2 × 2 FD binning mode	2048 (H) × 1500 (V) approx. 3.07 M pixels	205	SLVS 8 ch	8
		616	SLVS – EC 8 Lane	
		170	SLVS 8 ch	10
		592	SLVS – EC 8 Lane	
		145	SLVS 8 ch	12
		430	SLVS – EC 8 Lane	

## [Product Information]

Tentative

# IMX535-AAQJ

Ver.1.0

Diagonal 14.0 mm (Type 1/1.1) CMOS solid-state Image Sensor with Square Pixel for Color Cameras

### Description

The IMX535-AAQJ is a diagonal 14.0 mm (Type 1/1.1) CMOS active pixel type solid-state image sensor with a square pixel array and 12.41 M effective pixels. This chip features a global shutter with variable charge-integration time. This chip operates with analog 3.3 V, 2.9 V, digital 1.1 V, and interface 1.8 V quadruple power supply. High sensitivity and low dark current characteristics are achieved.

(Applications: FA cameras, ITS cameras)

### Features

- ◆ CMOS active pixel type dots
- ◆ Built-in timing adjustment circuit, H/V driver and serial communication circuit
- ◆ Global shutter function
- ◆ Input frequency 37.125 MHz / 74.25 MHz / 54 MHz
- ◆ Number of recommended recording pixels: 4096 (H) × 3000 (V) approx. 12.28 M pixels
- ◆ Readout mode
  - All-pixel scan mode
  - Vertical / Horizontal 1/2 Subsampling mode
  - ROI mode
  - Vertical / Horizontal - Normal / Inverted readout mode
- ◆ Readout rate
  - Maximum frame rate in
  - All-pixel scan mode: 8 bit 184.8 frame/s, 10 bit 184.1 frame/s, 12 bit 121.0 frame/s
- ◆ Pulse Output Function
  - The monitor output for Exposure period
  - Programmable pulse output
- ◆ 8-bit / 10-bit / 12-bit A/D converter
- ◆ CDS / PGA function
  - 0 dB to 24 dB: Analog Gain (0.1 dB step)
  - 24.1 dB to 48 dB: Analog Gain: 24 dB + Digital Gain: 0.1 dB to 24 dB (0.1 dB step)
- ◆ I/O interface
  - SLVS (4 ch / 8 ch switching) output (594 / 297 / 891 / 445.5 Mbps per ch)
  - SLVS - EC (1 Lane / 2 Lane / 4 Lane / 8 Lane) output (4.752 / 2.376 / 1.188 Gbps per Lane)
- ◆ Recommended lens F number: 2.8 or more (Close side)

### Pregius S

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◆ Number of active pixels	4128 (H) × 3008 (V)	Approx. 12.41 M pixels	
◆ Number of recommended recording pixels	4096 (H) × 3000 (V)	Approx. 12.28 M pixels	All-pixel
◆ Unit cell size	2.74 μm (H) × 2.74 μm (V)		
◆ Optical black	Horizontal (H) direction: Front 0 pixel, rear 0 pixel Vertical (V) direction: Front 64 pixels, rear 0 pixel		
◆ Package	230 pin LGA	20.0 mm (H) × 16.8 mm (V)	

**Image Sensor Characteristics**

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	8620 Digit/lx/s	
Saturation signal	Min.	4094 Digit	

**Basic Drive Mode**

Drive mode	Recommended number of recording pixels	Maximum frame rate [frame/s]	Output interface	ADC [bit]
All pixel	4096 (H) × 3000 (V) approx. 12.28 M pixels	60	SLVS 8 ch	8
		184	SLVS – EC 8 Lane	
		49	SLVS 8 ch	10
		184	SLVS – EC 8 Lane	
		41	SLVS 8 ch	12
		121	SLVS – EC 8 Lane	
Vertical / Horizontal 1/2 subsampling	2048 (H) × 1500 (V) approx. 3.07 M pixels	207	SLVS 8 ch	8
		348	SLVS – EC 8 Lane	
		171	SLVS 8 ch	10
		330	SLVS – EC 8 Lane	
		146	SLVS 8 ch	12
		232	SLVS – EC 8 Lane	