

Ver.1.0

Diagonal 17.5 mm (Type 1.1) CMOS solid-state Image Sensor with Square Pixel for Monochrome Cameras

### Description

The IMX541-AAMJ is a diagonal 17.5 mm (Type 1.1) CMOS active pixel type solid-state image sensor with a square pixel array and 20.35 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: 4504 (H) × 4504 (V) approx. 20.28 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 42 frame/s, 10 bit 34 frame/s, 12 bit 28 frame/s
  - (\*) At high frame rates, control so as not to exceed  $T_j = +100\text{ }^\circ\text{C}$
- ◆ 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 (2 ch / 4 ch / 8 ch switching) output (594 / 297 / 891 / 445.5 Mbps per ch)
  - SLVS - EC (1 Lane / 2 Lane) output (4.752 / 2.376 / 1.188 Gbps per Lane)
- ◆ Recommended lens F number: 2.8 or more (Close side)
- ◆ Recommended exit pupil distance: -100 mm to  $-\infty$

### 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 17.5 mm (Type 1.1)	Approx. 20.35 M pixels	All-pixel
◆ Total number of pixels	4512 (H) × 4576 (V)	Approx. 20.64 M pixels	
◆ Number of effective pixels	4512 (H) × 4512 (V)	Approx. 20.35 M pixels	
◆ Number of active pixels	4512 (H) × 4512 (V)	Approx. 20.35 M pixels	
◆ Number of recommended recording pixels	4504 (H) × 4504 (V)	Approx. 20.28 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		

**Image Sensor Characteristics**

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F8)	Typ.	2030 Digit	1/30 s accumulation
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	4504 (H) × 4504 (V) approx. 20.28 M pixels	35	SLVS 8 ch	8
		42	SLVS – EC 2 Lane	
		28	SLVS 8 ch	10
		34	SLVS – EC 2 Lane	
		26	SLVS 8 ch	12
		28	SLVS – EC 2 Lane	
Vertical / Horizontal 1/2 subsampling	2252 (H) × 2252 (V) approx. 5.07 M pixels	TBD	SLVS 8 ch	8
		TBD	SLVS – EC 2 Lane	
		TBD	SLVS 8 ch	10
		TBD	SLVS – EC 2 Lane	
		TBD	SLVS 8 ch	12
		TBD	SLVS – EC 2 Lane	
2 × 2 FD binning mode	2252 (H) × 2252 (V) approx. 5.07 M pixels	TBD	SLVS 8 ch	8
		TBD	SLVS – EC 2 Lane	
		TBD	SLVS 8 ch	10
		TBD	SLVS – EC 2 Lane	
		TBD	SLVS 8 ch	12
		TBD	SLVS – EC 2 Lane	

## [Product Information]

Tentative

# IMX541-AAQJ

Ver.1.0

Diagonal 17.5 mm (Type 1.1) CMOS solid-state Image Sensor with Square Pixel for Color Cameras

### Description

The IMX541-AAQJ is a diagonal 17.5 mm (Type 1.1) CMOS active pixel type solid-state image sensor with a square pixel array and 20.35 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: 4504 (H) × 4504 (V) approx. 20.28 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 42 frame/s, 10 bit 34 frame/s, 12 bit 28 frame/s
  - (\*) At high frame rates, control so as not to exceed  $T_j = +100\text{ }^\circ\text{C}$
- ◆ 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 (2 ch / 4 ch / 8 ch switching) output (594 / 297 / 891 / 445.5 Mbps per ch)
  - SLVS - EC (1 Lane / 2 Lane) output (4.752 / 2.376 / 1.188 Gbps per Lane)
- ◆ Recommended lens F number: 2.8 or more (Close side)
- ◆ Recommended exit pupil distance:  $-100\text{ mm}$  to  $-\infty$

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◆ Number of effective pixels	4512 (H) × 4512 (V)	Approx. 20.35 M pixels	
◆ Number of active pixels	4512 (H) × 4512 (V)	Approx. 20.35 M pixels	
◆ Number of recommended recording pixels	4504 (H) × 4504 (V)	Approx. 20.28 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		

**Image Sensor Characteristics**

(Tj = 60 °C)

Item		Value	Remarks
Sensitivity (F5.6)	Typ.	2571 Digit	1/30 s accumulation
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	4504 (H) × 4504 (V) approx. 20.28 M pixels	35	SLVS 8 ch	8
		42	SLVS – EC 2 Lane	
		28	SLVS 8 ch	10
		34	SLVS – EC 2 Lane	
		26	SLVS 8 ch	12
		28	SLVS – EC 2 Lane	
Vertical / Horizontal 1/2 subsampling	2252 (H) × 2252 (V) approx. 5.07 M pixels	TBD	SLVS 8 ch	8
		TBD	SLVS – EC 2 Lane	
		TBD	SLVS 8 ch	10
		TBD	SLVS – EC 2 Lane	
		TBD	SLVS 8 ch	12
		TBD	SLVS – EC 2 Lane	