

Diagonal 12.84 mm (Type 1/1.2) CMOS Solid-state Image Sensor with Square Pixel for Color Cameras

### Description

The IMX835-AQJ1 is a diagonal 12.84 mm (Type 1/1.2) 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.

(Application: Security 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. 8.29M 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: 90 frame/s
- ◆ High dynamic range (HDR) function
  - Digital overlap HDR
  - Clear HDR
- ◆ Synchronizing sensors function
- ◆ Variable-speed shutter function (resolution 2H units)
- ◆ 10-bit / 12-bit A/D converter
- ◆ 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 / RAW16 (Clear HDR) output
- ◆ AR coating on cover glass (Both sides)

## STARVIS 2

\* STARVIS 2 and its logo 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  $\mu\text{m}^2$  (color product, when imaging with a 706 cd/m<sup>2</sup> 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.

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## Device Structure

|  |   |
|--|---|
| ◆ CMOS image sensor                      |   |
| ◆ Image size                             | Diagonal 12.84 mm (Type 1/1.2) approx. 8.40 M pixels, All pixels  |
| ◆ Total number of pixels                 | 3856 (H) × 2220 (V) approx. 8.56 M pixels   |
| ◆ Number of effective pixels             | 3856 (H) × 2180 (V) approx. 8.40 M pixels   |
| ◆ Number of active pixels                | 3856 (H) × 2176 (V) approx. 8.39 M pixels   |
| ◆ Number of recommended recording pixels | 3840 (H) × 2160 (V) approx. 8.29 M pixels   |
| ◆ Unit cell size                         | 2.9 μm (H) × 2.9 μm (V)   |
| ◆ Optical black                          | Horizontal (H) direction: Front 0 pixels, rear 0 pixels<br>Vertical (V) direction: Front 20 pixels, rear 0 pixels |
| ◆ Dummy                                  | Horizontal (H) direction: Front 0 pixels, rear 0 pixels<br>Vertical (V) direction: Front 0 pixels, rear 0 pixels  |
| ◆ Package                                | 122 pin LGA   |

## Image Sensor Characteristics

(T<sub>j</sub> = 60 °C)

| Item              |      | Value                        | Remarks                |
|-------------------|------|------------------------------|------------------------|
| Sensitivity       | Typ. | 19556 Digit/lx/s (Tentative) | 12 bit converted value |
| Saturation signal | Min. | 3895 Digit (Tentative)       | 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)<br>approx. 8.29 M pixels | 90                           | CSI-2            | 10        |
| Horizontal/<br>Vertical 2/2-line<br>binning | 1920 (H) × 1080 (V)<br>approx. 2.07 M pixels | 90                           | CSI-2            | 10        |

