**Description**

The IMX901-AQR is a diagonal 22.67 mm (Type 1.4) CMOS active pixel type solid-state image sensor with a square pixel array and 16.41 M effective pixels. This chip features a global shutter with variable charge-integration time. This chip operates with 3.3 V, 2.9 V, 1.1 V, and 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 6 to 27 MHz (only for CSI-2) / 37.125 MHz / 74.25 MHz
- Number of recommended recording pixels: 8008 (H) × 2040 (V) approx. 16.33 M pixel
- 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: 10-bit 134.7 frame/s, 12-bit 91.5 frame/s (Tentative)
  - (*) At high frame rates, control so as not to exceed Tj = +100 °C
- Variable-speed shutter function (resolution 1 H units)
- Pulse Output Function
  - The monitor output for Exposure period (TOUT0)
- 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) output
  - SLVS-EC (1 Lane / 2 Lane / 4 Lane) output
  - CSI-2 (1 Lane / 2 Lane / 4 Lane) output
- CRA characteristics
  - The target CRA is 9.7 degree at 100% image height

* Pregius S and its logo are registered trademarks or trademarks of Sony Group Corporation or its affiliates. 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 realizes small chip size and high sensitivity, whilst using the high picture quality global shutter pixel technology of Pregius.

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Device Structure

◆ CMOS image sensor
◆ Image size  Diagonal 22.67 mm (Type 1.4)  Approx. 16.41 M pixels
◆ Total number of pixels  8016 (H) × 2112 (V)  Approx. 16.92 M pixels
◆ Number of effective pixels  8016 (H) × 2048 (V)  Approx. 16.41 M pixels
◆ Number of active pixels  8016 (H) × 2048 (V)  Approx. 16.41 M pixels
◆ Number of recommended recording pixels  8008 (H) × 2040 (V)  Approx. 16.33 M pixels
◆ Unit cell size  2.74 µm (H) × 2.74 µm (V)
◆ Optical black  Horizontal (H) direction: Front 0 pixels, rear 0 pixel
  Vertical (V) direction: Front 64 pixels, rear 0 pixel
◆ Package  260 pin LGA  38.0 mm (H) × 22.0 mm (V)

Image Sensor Characteristics

(Tj = 60 °C)

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>Typ.</td>
<td>TBD Digit/lx/s</td>
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<tr>
<td>Saturation signal</td>
<td>Min.</td>
<td>TBD Digit</td>
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</table>

Basic Drive Mode

<table>
<thead>
<tr>
<th>Drive mode</th>
<th>Recommended number of recording pixels</th>
<th>Maximum frame rate [frame/s]</th>
<th>Output interface</th>
<th>ADC [bit]</th>
</tr>
</thead>
<tbody>
<tr>
<td>All pixel</td>
<td>8008 (H) × 2040 (V) Approx. 16.33 M pixels</td>
<td>52.8 SLVS 8 ch</td>
<td></td>
<td>10</td>
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<tr>
<td></td>
<td></td>
<td>134.7 SLVS-EC 4 Lane</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>52.0 CSI-2 4 Lane</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>44.4 SLVS 8 ch</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>91.5 SLVS-EC 4 Lane</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>43.8 CSI-2 4 Lane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical / Horizontal 1/2 subsampling</td>
<td>4004 (H) × 1020 (V) approx. 4.08 M pixels</td>
<td>197.2 SLVS 8 ch</td>
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<td>10</td>
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<tr>
<td></td>
<td></td>
<td>263.3 SLVS-EC 4 Lane</td>
<td></td>
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<tr>
<td></td>
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<td>191.9 CSI-2 4 Lane</td>
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<tr>
<td></td>
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<td>167.3 SLVS 8 ch</td>
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<td></td>
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<td>179.8 SLVS-EC 4 Lane</td>
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<tr>
<td></td>
<td></td>
<td>163.3 CSI-2 4 Lane</td>
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</table>

Note: All of frame rate are tentative.

Image Sensors for Industrial Applications:  https://www.sony.net/cis-industry