IMX392LLR

Diagonal 7.9 mm (Type 1 / 2.3) CMOS solid-state Image Sensor with Square Pixel for Monochrome Cameras

Description

The IMX392LLR is a diagonal 7.9 mm (Type 1 / 2.3) CMOS active pixel type solid-state image sensor with a square pixel array and 2.35 M effective pixels. This chip features a global shutter with variable charge-integration time. This chip operates with analog 3.3 V, digital 1.2 V, and interface 1.8 V triple power supply, and has low power consumption. High sensitivity, low dark current and low PLS 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: 1920 (H) × 1200 (V) approx. 2.30 M pixels
  
  Readout mode
  All-pixel scan mode
  1080p-Full HD readout mode
  Vertical / Horizontal 1 / 2 Subsampling mode
  2 × 2 Vertical FD Binning mode
  ROI mode
  Vertical / Horizontal - Normal / Inverted readout mode
◆ Readout rate
  Maximum frame rate in
  All-pixel scan mode: 8 bit: 201.4 frame/s, 10 bit: 167.0 frame/s, 12 bit: 134.6 frame/s
◆ 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
  Low voltage LVDS (150 mVp-p) serial (2 ch / 4 ch / 8 ch switching) DDR output
  (594 / 297 Mbps per ch)
  (445.5 / 222.75 Mbps per ch in 1080p-Full HD)
◆ Recommended lens F number: 2.8 or more (Close side)
◆ Recommended exit pupil distance: –100 mm to –∞

Pregius

* Pregius is a trademark of Sony Corporation. The Pregius is global shutter pixel technology for active pixel-type CMOS image sensors that use Sony’s low-noise CCD structure, and realizes high picture quality.

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 7.9 mm (Type 1 / 2.3)  Approx. 2.35 M pixels All-pixel
  - Diagonal 7.7 mm (Type 1/2.35)  Approx. 2.11 M pixels 1080p-Full HD
- **Total number of pixels**
  - 1936 (H) × 1226 (V)  Approx. 2.37 M pixels
- **Number of effective pixels**
  - 1936 (H) × 1216 (V)  Approx. 2.35 M pixels
- **Number of active pixels**
  - 1936 (H) × 1216 (V)  Approx. 2.35 M pixels
- **Number of recommended recording pixels**
  - 1920 (H) × 1200 (V)  Approx. 2.30 M pixels All-pixel
  - 1920 (H) × 1080 (V)  Approx. 2.07 M pixels 1080p-Full HD
- **Unit cell size**
  - 3.45 µm (H) × 3.45 µm (V)
- **Optical black**
  - Horizontal (H) direction: Front 0 pixel, rear 0 pixel
  - Vertical (V) direction: Front 10 pixels, rear 0 pixel
- **Package**
  - 226 pin LGA

Image Sensor Characteristics

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (F8)</td>
<td>Typ. 915 mV</td>
<td>1/30 s accumulation</td>
</tr>
<tr>
<td>Saturation signal</td>
<td>Min. 1001 mV</td>
<td></td>
</tr>
</tbody>
</table>

(Tj = 60 °C)

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>1920 (H) × 1200 (V) approx. 2.30 M pixels</td>
<td>201.4</td>
<td>Serial LVDS 8 ch</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>167.0</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>134.6</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>All pixel (Vertical / Horizontal 1/2 subsampling)</td>
<td>960 (H) × 600 (V) approx. 0.58 M pixels</td>
<td>415.1</td>
<td>Serial LVDS 8 ch</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>396.3</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>262.2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Vertical FD Binning</td>
<td>960 (H) × 600 (V) approx. 0.58 M pixels</td>
<td>415.1</td>
<td>Serial LVDS 8 ch</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>396.3</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>262.2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>HD1080p</td>
<td>1920 (H) × 1080 (V) approx. 2.07 M pixels</td>
<td>120</td>
<td>Serial LVDS 8 ch</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>120</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>
[Product Information]  IMX392LQR

Ver.1.1
Diagonal 7.9 mm (Type 1 / 2.3) CMOS solid-state Image Sensor with Square Pixel for Color Cameras

Description

The IMX392LQR is a diagonal 7.9 mm (Type 1 / 2.3) CMOS active pixel type solid-state image sensor with a square pixel array and 2.35 M effective pixels. This chip features a global shutter with variable charge-integration time. This chip operates with analog 3.3 V, digital 1.2 V, and interface 1.8 V triple power supply, and has low power consumption. High sensitivity, low dark current and low PLS 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: 1920 (H) × 1200 (V) approx. 2.30 M pixels
  Readout mode
  All-pixel scan mode
  1080p-Full HD readout 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: 201.4 frame/s, 10 bit: 167.0 frame/s, 12 bit: 134.6 frame/s
◆ 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
  Low voltage LVDS (150 mVp-p) serial (2 ch / 4 ch / 8 ch switching) DDR output
  (594 / 297 Mbps per ch)
  (445.5 / 222.75 Mbps per ch in 1080p-Full HD)
◆ Recommended lens F number: 2.8 or more (Close side)
◆ Recommended exit pupil distance: –100 mm to –∞

Pregius

* Pregius is a trademark of Sony Corporation. The Pregius is global shutter pixel technology for active pixel-type CMOS image sensors that use Sony’s low-noise CCD structure, and realizes high picture quality.

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 7.9 mm (Type 1 / 2.3)  Approx. 2.35 M pixels All-pixel
  Diagonal 7.7 mm (Type 1/2.35)  Approx. 2.11 M pixels 1080p-Full HD
◆ Total number of pixels
  1936 (H) × 1226 (V)  Approx. 2.37 M pixels
◆ Number of effective pixels
  1936 (H) × 1216 (V)  Approx. 2.35 M pixels
◆ Number of active pixels
  1936 (H) × 1216 (V)  Approx. 2.35 M pixels
◆ Number of recommended recording pixels
  1920 (H) × 1200 (V)  Approx. 2.30 M pixels  All-pixel
  1920 (H) × 1080 (V)  Approx. 2.07 M pixels  1080p-Full HD
◆ Unit cell size
  3.45 µm (H) × 3.45 µm (V)
◆ Optical black
  Horizontal (H) direction: Front 0 pixel, rear 0 pixel
  Vertical (V) direction: Front 10 pixels, rear 0 pixel
◆ Package
  226 pin LGA

Image Sensor Characteristics

(Tj = 60 °C)

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (F5.6)</td>
<td>Typ.</td>
<td>1146 mV</td>
</tr>
<tr>
<td>Saturation signal</td>
<td>Min.</td>
<td>1001 mV</td>
</tr>
</tbody>
</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>1920 (H) × 1200 (V)  approx. 2.30 M pixels</td>
<td>201.4</td>
<td>Serial LVDS 8 ch 8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>167.0</td>
<td>Serial LVDS 8 ch 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>134.6</td>
<td>Serial LVDS 8 ch 12</td>
<td></td>
</tr>
<tr>
<td>All pixel (Vertical / Horizontal 1/2 subsampling)</td>
<td>960 (H) × 600 (V)  approx. 0.58 M pixels</td>
<td>415.1</td>
<td>Serial LVDS 8 ch 8</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>396.3</td>
<td>Serial LVDS 8 ch 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>262.2</td>
<td>Serial LVDS 8 ch 12</td>
<td></td>
</tr>
<tr>
<td>HD1080p</td>
<td>1920 (H) × 1080 (V)  approx. 2.07 M pixels</td>
<td>120</td>
<td>Serial LVDS 8 ch 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>120</td>
<td>Serial LVDS 8 ch 12</td>
<td></td>
</tr>
</tbody>
</table>