IMX412-AACK
Diagonal 7.857 mm (Type 1/2.3) 12.3 Mega-Pixel CMOS Image Sensor with Square Pixel for Color Cameras

Description
IMX412-AACK is a diagonal 7.857 mm (Type 1/2.3) 12.3 Mega-pixel CMOS active pixel type stacked image sensor with a square pixel array. R, G, and B pigment primary color mosaic filter is employed. It equips an electronic shutter with variable integration time. It operates with three power supply voltages: analog 2.75 V, digital 1.05 V and 1.8 V for input/output interface and achieves low power consumption. (Applications: Surveillance cameras)

Features
◆ Back-illuminated and stacked CMOS image sensor
◆ Digital Overlap High Dynamic Range (DOL-HDR) mode with raw data output
◆ High signal to noise ratio (SNR)
◆ Full resolution @60 frame/s (Normal), 4K2K @60 frame/s (Normal), 1080p @240 frame/s
  Full resolution @40 frame/s (12 bit Normal), Full resolution @30 frame/s (DOL-HDR, 2 frame)
◆ Output video format of RAW12/10
◆ Low Power Streaming Mode with MIPI ULPS operation
◆ Pixel binning readout and V sub-sampling function
◆ Independent flipping and mirroring
◆ Input clock frequency 6, 12, 18, 24 or 27 MHz
◆ CSI-2 serial data output (MIPI 2lane/4lane, Max. 2.1 Gbps/lane, D-PHY spec. ver. 1.2 compliant)
◆ 2-wire serial communication
◆ Two PLLs for independent clock generation for pixel control and data output interface
◆ Defect Pixel Correction (DPC)
◆ Fast mode transition (on the fly)
◆ Dual sensor synchronization operation (Multi camera compatible)
◆ 7 k bit of OTP ROM for users
◆ 10-bit/12-bit A/D conversion on chip
◆ Horizontal Low Power analog Cropping
◆ 92-pin high-precision ceramic package

* STARVIS is a registered trademark or trademark of Sony Group Corporation or its affiliates. The STARVIS is back-illuminated pixel technology used in CMOS image sensors for security camera applications. It features a sensitivity of 2000 mV or more per 1μm² (color product, when imaging with a 706 cd/m² light source, F5.6 in 1 s accumulation equivalent), and realizes high picture quality in the visible-light and near infrared light regions.
Device Structure

◆ CMOS image sensor
◆ Image size Diagonal 7.857 mm (Type 1/2.3)
◆ Total number of pixels 4072 (H) × 3176 (V) approx. 12.93 M pixels
◆ Number of effective pixels 4072 (H) × 3064 (V) approx. 12.47 M pixels
◆ Number of active pixels 4056 (H) × 3040 (V) approx. 12.33 M pixels
◆ Chip size 7.564 mm (H) × 5.476 mm (V)
◆ Unit cell size 1.55 µm (H) × 1.55 µm (V)
◆ Package 92 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 (F2.8) Min.</td>
<td>250 LSB</td>
<td>1/120 s accumulation</td>
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<tr>
<td>Saturation signal Min.</td>
<td>1023 LSB</td>
<td></td>
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</tbody>
</table>

Basic Drive Mode

<table>
<thead>
<tr>
<th>Drive mode</th>
<th>Number of active pixels</th>
<th>Maximum frame rate [frame/s]</th>
<th>Output interface</th>
<th>ADC [bit]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full resolution (4:3) (Normal)</td>
<td>4056 (H) × 3040 (V) approx. 12.33 M pixels</td>
<td>60 CSI-2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4K2K (16:9) (Normal)</td>
<td>4056 (H) × 2288 (V) approx. 9.28 M pixels</td>
<td>79 CSI-2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1080p (16:9) Binning (Normal)</td>
<td>2028 (H) × 1112 (V) approx. 2.26 M pixels</td>
<td>240 CSI-2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Full resolution (4:3) (DOL-HDR, 2 frame)</td>
<td>4056 (H) × 3040 (V) approx. 12.33 M pixels</td>
<td>30 CSI-2</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Image Sensors for Security Cameras: https://www.sony.net/cis-security/