CMOS Image Sensors for Industrial Applications Improves Near Infrared Sensitivity

HD/Full HD CMOS High Sensitivity Image Sensors for Industrial Applications

To improve sensitivity in the near infrared light region for industrial applications, Sony developed CMOS image sensors "IMX222LQJ", "IMX236LQJ", and "IMX238LQJ" for high picture quality at the low illumination, greatly exceeding the existing products. Newly developed process and pixel technologies pushed up the sensitivity in the near infrared light region, up to 2 times compared with the existing products "IMX122LQJ".*1

"IMX136LQJ"*2, and "IMX138LQJ". For Day/Night cameras, which are also strongly demanded in recent years, better visibility improves surveillance performance, and fewer number of LED parts reduce the power consumption and cost.

*1: See the New Products section in CX-NEWS, Volume 65.
*2: See the New Products section in CX-NEWS, Volume 68.

Higher Sensitivity in the Near Infrared Light Region

High picture quality at the low illumination is strongly requested for industrial application cameras. Responding to this demand, Sony developed CMOS image sensors and improved sensitivity in the near infrared light region, not only in the visible light range. The CMOS image sensors used the technology from the EXview HAD CCDTM, and the sensitivity in the near infrared light region improved up to 2 times compared to the current products. This enables to identify objects clearly enough even in the night-time shooting. (Photograph 1)

*: EXview HAD CCD is a trademark of Sony Corporation.

Achieves Both High Sensitivity and High Resolution

Utilizing the Sony’s original technology, the IMX222LQJ, IMX236LQJ, and IMX238LQJ were developed and achieved significant improvements in the sensitivity characteristics in the near infrared light region, as well as the high resolution and low crosstalk of the existing products.

Compatibility with Existing Sony Products

The IMX222LQJ, IMX236LQJ, and IMX238LQJ have the same image size, number of pixels, package, and pin configuration of the current Sony products: the IMX122LQJ, IMX136LQJ, and IMX138LQJ. Customers using the current products are easily able to replace with the new products. Please do not miss the chance to try the performance of the IMX222LQJ, IMX236LQJ, and IMX238LQJ.
<Table 1> Device Structure

<table>
<thead>
<tr>
<th>Item</th>
<th>IMX222LQJ</th>
<th>IMX236LQJ</th>
<th>IMX238LQJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image size</td>
<td>Diagonal 6.4 mm (Type 1/2.8)</td>
<td>Diagonal 6.4 mm (Type 1/2.8)</td>
<td>Diagonal 6.28 mm (Type 1/3)</td>
</tr>
<tr>
<td>Number of effective pixels</td>
<td>1984(H) × 1225(V) Approx. 2.43M pixels</td>
<td>1944(H) × 1224(V) Approx. 2.38M pixels</td>
<td>1305(H) × 1049(V) Approx. 1.37M pixels</td>
</tr>
<tr>
<td>Unit cell size</td>
<td>2.8 μm (H) × 2.8 μm (V)</td>
<td>2.8 μm (H) × 2.8 μm (V)</td>
<td>3.75 μm (H) × 3.75 μm (V)</td>
</tr>
<tr>
<td>Input drive frequency</td>
<td>54 MHz / 37.125 MHz</td>
<td>54 MHz/27 MHz/37.125 MHz/74.25 MHz</td>
<td>54 MHz/27 MHz/37.125 MHz/74.25 MHz</td>
</tr>
<tr>
<td>Package</td>
<td>94-pin LGA</td>
<td>94-pin LGA</td>
<td>94-pin LGA</td>
</tr>
<tr>
<td>Supply voltage Vcc (Typ.)</td>
<td>2.7 V / 1.8 V / 1.2 V</td>
<td>2.7 V / 1.8 V / 1.2 V</td>
<td>3.3 V / 1.8 V / 1.2 V</td>
</tr>
<tr>
<td>Sensitivity (F5.6) (Typ.)</td>
<td>510 mV</td>
<td>510 mV</td>
<td>1300 mV</td>
</tr>
<tr>
<td>Saturation signal (Min.)</td>
<td>812 mV</td>
<td>812 mV</td>
<td>1440 mV</td>
</tr>
<tr>
<td>Output method</td>
<td>CMOS parallel, low voltage LVDS serial</td>
<td>CMOS parallel, low voltage LVDS parallel/serial</td>
<td>CMOS parallel, low voltage LVDS parallel/serial</td>
</tr>
<tr>
<td>Communication Interface</td>
<td>I²C, 4-wire serial</td>
<td>I²C, 4-wire serial</td>
<td>I²C, 4-wire serial</td>
</tr>
<tr>
<td>Drive mode (All-pixel scan)</td>
<td>1984(H) × 1225(V) Approx. 2.43M pixels 10 bit 40 frame/s, 12 bit 20 frame/s</td>
<td>1944(H) × 1224(V) Approx. 2.38M pixels 10 bit 108 frame/s, 12 bit 54 frame/s</td>
<td>1305(H) × 1049(V) Approx. 1.37M pixels 12 bit 60 frame/s</td>
</tr>
<tr>
<td>Drive mode (HD)</td>
<td>1984(H) × 1105(V) Approx. 2.19M pixels 10 bit/12 bit 30 frame/s</td>
<td>1944(H) × 1104(V) Approx. 2.14M pixels 10 bit 120 frame/s, 12 bit 60 frame/s</td>
<td>1305(H) × 733(V) Approx. 0.96M pixels 12 bit 60 frame/s</td>
</tr>
</tbody>
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