Sony’s CMOS Image Sensor for Automotive

IMX490
1/1.55-type 5.44megapixels CMOS image sensor

1. The IMX490 back-illuminated stacked CMOS Product Features image sensor achieves simultaneous HDR shooting and LED flicker*1 mitigation and features industry’s highest*2 5.4 effective megapixels,*3 enabling wide-angle shooting for ADAS/autonomous driving.

2. 120dB*4 HDR function three times that of conventional product, plus motion artifact mitigation*5.

3. High sensitivity of 2280 mV (standard value: F5.6) improved by approximately 15% over that of conventional product.

*1: LED flickering that occurs when photographing LED indicators, traffic lights, etc.
*2: As of announcement on December 18, 2018
*3: Based on image sensor effective pixel specification method
*4: In accordance to the EMVA 1288 standard. 140dB when set to prioritize dynamic range.
*5: Depends on conditions. A function introduced with the IMX390 (current model).
*6: Conforms to ASIL-D. A portion of the failure rate metric has been tailored.

Product Features

- 1/1.55-type back-illuminated stacked CMOS image sensor
- Unit cell size: 3.0μm
- Number of recommended recording pixels: 2896 (H) X 1876 (V) approx. 5.40M pixels
- Maximum frame rate in full pixel reading: AD10bit 40fps, AD12bit 30fps
- High dynamic range (HDR) function with 120dB (EMVA 1288 standard, 140dB when set to prioritize dynamic range.)
- LED flicker mitigation function
- Variable speed shutter function
- MIPI CSI-2 serial output (4 lane / 2 lane)
- Temperature sensor
- Support security feature for automotive
- ISO 26262/ASIL-D*6
- AEC-Q100 Grade 2
<table>
<thead>
<tr>
<th>Model name</th>
<th>IMX490</th>
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<tbody>
<tr>
<td>Number of effective pixels</td>
<td>2896 (H) × 1876 (V) 5.40 megapixels</td>
</tr>
<tr>
<td>Image size</td>
<td>Diagonal 10.36 mm (Type 1/1.55)</td>
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<tr>
<td>Unit cell size</td>
<td>3.0 μm (H) X 3.0 μm (V)</td>
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<tr>
<td>Frame rate</td>
<td>Full pixel reading AD10bit 40fps, AD12bit 30fps</td>
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<tr>
<td>Sensitivity (F5.6 Standard Value, 1/30 sec. exposure time)</td>
<td>2280mV (Green pixel)</td>
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<tr>
<td>Dynamic range (EMVA Standard 1288)</td>
<td>120dB (140dB when prioritizing dynamic range)</td>
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<tr>
<td>Power supply</td>
<td>Analog: 3.3V</td>
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<tr>
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<td>Digital: 1.1V</td>
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<td>Interface: 1.8V</td>
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<tr>
<td>Interface</td>
<td>MIPI CSI-2 serial output (4 lane / 2 lane)</td>
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<tr>
<td>Package</td>
<td>124pin Plastic BGA</td>
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<tr>
<td>Package size</td>
<td>15.35 mm X 11.68 mm</td>
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</table>

**Field of view comparison**

IMX490  
Equivalent to 2.0M image sensor

**LED flicker comparison**

Image captured with IMX490  
Simultaneous HDR & LFM

Image Captured with Equivalent to 2.0M image sensor  
HDR function only