Sony’s CMOS Image Sensor

for Automotive

ISX016
1/4-type 1.26megapixels CMOS image sensor
System-on-Chip

1. System-on-Chip consists of a diagonal 4.54mm (Type 1/4) CMOS image sensor and a high performance image processing engine - Quad-VGA (approx. 1.26mega) effective square pixel array with 2.8μm unit pixel size with high sensitivity to near infrared light - Camera ISP functions such as AE and AWB - Built-in wide dynamic range function - Y/C digital video output from a parallel interface

2. Low power consumption operated with analog 2.7V and digital 1.8V/1.2V triple power supply voltages

3. Suitable for small form-factor automotive camera module application with this one chip device - Embedded control software coded in on-chip ROM

Product Features

- 12-bit A/D converter on chip
- PLL on chip
- High sensitivity, low dark current, no smear
- High frame rates (Quad-VGA 60 frame/s, 1280 × 720 60 frame/s)
- Vertical flip and horizontal mirror function (Start up setting)
- AE and AWB control functions
- Wide dynamic range function
- Input frequency: 27MHz
- Y/C digital output
- Analog output
- 11-bit D/A converter output
- Control interface (I2C,SPI,UART)
- External synchronous function supported
- EEPROM control function
- AEC-Q100 Grade 2
# Product Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>ISX016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of effective pixels</td>
<td>1296 (H) x 976 (V) 1.26 megapixels</td>
</tr>
<tr>
<td>Image size</td>
<td>Diagonal 4.54mm (type 1/4)</td>
</tr>
<tr>
<td>Unit cell size</td>
<td>2.8μm (H) x 2.8μm (V)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame rate</th>
<th>HD720p 60fps, 50fps, 30fps, 25fps (Progressive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTSC</td>
<td>59.94fps (Interlace)</td>
</tr>
<tr>
<td>PAL</td>
<td>50fps (Interlace)</td>
</tr>
</tbody>
</table>

| Scaling Output mode | VGA, WVGA, XGA, HD720, WXGA, Quad-VGA |

| Sensitivity (F5.6 standard value, 1/30 second storage time) | 510mV (green pixel) |

<table>
<thead>
<tr>
<th>Power supply</th>
<th>Analog 2.7V</th>
</tr>
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<tbody>
<tr>
<td>Digital</td>
<td>1.2V</td>
</tr>
<tr>
<td>Interface</td>
<td>1.8V</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Interface</th>
<th>CMOS Parallel / Analog (NTSC/PAL)</th>
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<tr>
<th>Package</th>
<th>96pin BGA</th>
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<tr>
<td>Package size</td>
<td>8.5mm x 9.5mm</td>
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## Image of Wide Dynamic Range

Wide dynamic range function : OFF  
Wide dynamic range function : ON

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## Block Diagram

[Image of Block Diagram]

**Output I/F**  
ANALOG(CVBS)  
DIGITAL(parallel)  
VDAOUTP  
DO[15:0]  
VSYNC  
HSYNC  
DCK

**HOST I/F**  
SCL  
SDA  
EXBUSY

**EEPROM I/F**  
SCKM  
SDIM  
SDOM  
XCEM

**Peripheral Blocks**  
12C  
SPI  
UART  
GPIO  
e tc.

**Image Signal Processor**  
Resizer

**ROM**  
Microcontroller  
SRAM

**1.3M CMOS Image Sensor**  
Resizer

**Output I/F**  
ANALOG(CVBS)  
DIGITAL(parallel)  
VDAOUTP  
DO[15:0]  
VSYNC  
HSYNC  
DCK

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Version 1.0a, Feb.2016